

EMINENT QUEENSLAND ENGINEERS

Editor
R. L. Whitmore

Eminent Queensland Engineers

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TABLE OF CONTENTS

	Page
INTRODUCTION.....	3
CONTRIBUTORS.....	5
BIOGRAPHIES	
1. Colonel Sir Albert Axon.....	6
2. E.G.C. Barton	8
3. A.A. Boyd.....	10
4. A.B. Brady	12
5. Joseph Brady	14
6. A.B. Corbett	16
7. W.H. Corbould	18
8. E.S. Cornwall.....	20
9. G.A. Cowling	22
10. W.J. Cracknell.....	24
11. A.E. Cullen.....	26
12. R.T. Darker	28
13. Colonel D.E. Evans	30
14. A.J. Goldsmith.....	32
15. Professor R.W.H. Hawken	34
16. J.B. Henderson.....	36
17. H. Horniblow	38
18. J.S. Just	40

	Page
19. Sir John Kemp	42
20. J.E. Kindler	44
21. Julius Kruttschnitt	46
22. W.M.E. L'Estrange.....	48
23. C.B. Mott	50
24. W.M. Nelson.....	52
25. J.M. Newman.....	54
26. W.H.R. Nimmo.....	56
27. W.D. Nisbet	58
28. Lieutenant-Colonel D.E. Reid.....	60
29. Lieutenant-Colonel W.J. Reinhold	62
30. G.A. Richard	64
31. H.E.B. Scriven	66
32. H.C. Stanley.....	68
33. E.L.A. Weinberg	70
34. A.L. Wilson.....	72
ABBREVIATIONS	74

INTRODUCTION

The idea of compiling and publishing brief biographies of Queensland's most eminent engineers cannot be attributed to any single person, a number of people having suggested it at various times in the past. In 1982, however, in the hands of a sub-committee of the Engineering Heritage Committee of the Queensland Division of the Institution of Engineers, Australia, the idea quickly hardened into a viable proposition. Guide-lines were laid down, regional and individual discipline groups of the Institution in Queensland were contacted for suggestions, and the work began.

The choice of engineers for inclusion in such a compilation is obviously a continuing exercise in selectivity and criteria refinement. Eminence in engineering rests upon subtle blends of wide-ranging ability and personality which are difficult to specify exactly, and the suggestions received disclosed that Queensland has been well served by many engineers who made important but sometimes unnoticed contributions in narrow fields of expertise or in particular parts of the State. Moreover, readers aware of the state of engineering in Australia prior to the formation of the Institution in 1919 will recognize that the lines of professionalism were not as closely drawn in the past as they are today. There were few schools where professional engineering was taught, there was no validation system for the courses and there was no national engineering institution to oversee the profession. Some highly-skilled practitioners of engineering were self-taught or gained their qualifications and experience before coming to Queensland; some stayed only briefly while others remained for the rest of their lives. A few received their training in Queensland but carried out significant engineering work elsewhere. In these

circumstances the sub-committee rigorously applied only one rule, which was that the candidate must have been dead for at least five years. The final choice was inevitably subjective and certainly fallible so that comments or suggestions from readers which might improve future editions of the compilation would be welcome.

Research on the final list of engineers was organized by a sub-committee and carried out by a team of expert contributors whose names appear on page 5; the initials at the end of each biography are those of the respective contributor. In addition, many individuals and families gave generously of their time, and provided material which was unobtainable from any other source. The staffs of the John Oxley Library, the University of Queensland libraries and the Queensland State Archives responded willingly and expertly to our frequent queries. The archivist to the Institution of Civil Engineers in London (Mr W. A. Morris) extracted valuable information from his Institution's records, and the staff of the Audio-Visual Services of the University of Queensland applied their many skills to reproducing the historic photographs which form an important part of this work. We are deeply indebted to the Editor of the Australian Dictionary of Biography (ADB) for permission to draw heavily on that authoritative work. It is a great pleasure to acknowledge with gratitude the voluntary assistance of many people, to whom is due the credit for any success which this volume may achieve. The editor wishes to thank them all and in return accepts responsibility for any imperfections.

Finally I must thank Mrs. Margaret Lee for her invaluable assistance in integrating the disparate elements of the manuscript into a homogeneous structure suitable for publication, and the Queensland Divisional Committee for giving the project its support and blessing.

PANEL OF CONTRIBUTORS

Membership of the sub-committee is indicated by an asterisk.

- | | | |
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1.

COLONEL SIR ALBERT AXON

KBE, Hon. DEng Melb. & Qld, Hon.DSc N.E., ME Qld,
Hon. FIEAust, FIEEE



Photograph by
courtesy of Mr
R. W. Axon.

AXON, ALBERT EDWIN (1898-1974), engineer, administrator and soldier. Axon was born in Brisbane on 21 December 1898, the son of H.F. Axon formerly of Lancashire, England. After attending the Normal School and the Brisbane Grammar School he won the Bowen Prize and was awarded the first Open Scholarship to the University of Queensland when he matriculated in 1916. In sport he was in the school rugby fifteen, was a champion gymnast and rowed in the crew.

In 1917 he entered the Faculty of Engineering at the University of Queensland but enlisted in the AIF at the end of the year. The war ended while he was in a troopship and he returned to continue his course at the University. In 1923 he graduated in Mechanical and Electrical Engineering with First Class Honours. On graduation he proceeded overseas to gain experience and worked in Britain, Switzerland and the USA until 1926 when he returned to Brisbane and was employed by Harding Frew, consulting engineer, until 1929. In 1928 he secured his Master's degree in engineering from the University of Queensland and in 1929 set up in practice as a consulting engineer, soon advising a number of electric authorities in Queensland and northern New South Wales. The early 1930s was a time of rapid development in the electrical industry and Axon was a leading consultant in the field. In 1936 he was appointed to the Royal Commission on Electrical Development which recommended the setting up of

the State Electricity Commission in Queensland on which he acted as a part-time Commissioner until 1947.

During World War II, Axon again enlisted, serving from 1942 to 1945 and becoming Deputy Director of Mechanical Engineering, Queensland Lines of Communication Area, with the rank of Colonel. In 1935 he was elected to the Senate of the University of Queensland and, except for his period of war service, remained a Senator until his retirement in February 1966. He was Chairman of the Buildings and Grounds Committee and in 1957 was elected Chancellor, a position which he held until his retirement. The nine years during which he occupied this position was a period of great expansion, with the spending of millions of dollars on capital works, the establishment of a college at Townsville and the planning of a new university in Brisbane. In 1959 he was honoured with the award of the KBE in recognition of his work for the University of Queensland.

In spite of the time devoted to the position of Chancellor he was still very active in the business world. He was retained by the Brisbane City Council on an investigation into the control of electricity supply and was a member of the State Government Committee reporting on development prospects for Queensland. He was a member of the Board of the Commonwealth Banking Corporation, Chairman of four companies and a member of the board of directors of several others.

In 1921 during his engineering course Axon had joined the Institution of Engineers, Australia as a Student Member and in 1926 he gained Corporate Membership. In 1936 he became a Member (changed by Council to Fellow in 1968), serving as a Councillor from 1937 to 1940. In 1960 he won the Institution's Peter Nicol Russell Memorial Medal and was elected an Honorary Fellow in 1966. Honorary doctorates from the Universities of Queensland, Melbourne and New England testified to the esteem in which he was held.

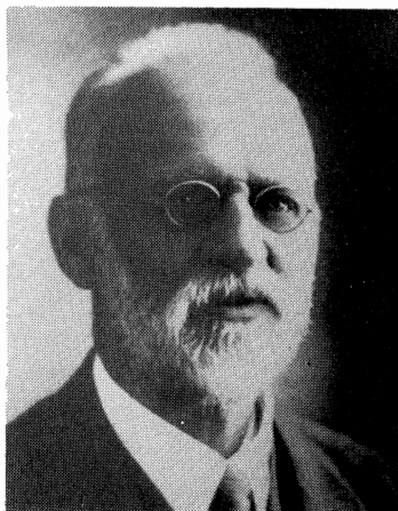
Axon married Hilda, daughter of W. Withecombe of Brisbane in June 1926. He died in Brisbane on 17 February 1974 at the age of seventy-five, survived by his wife and a family of one son and one daughter.

University of Qld Gazette, No. 61 (1966); 'Brisbane Grammar School Annals, 1869-1922' (Brisb, 1923); information from Mr R.W. Axon, Brisbane, and University of Qld Archives.

(WIG)

E. G. C. BARTON

AMIEAust, MIEE, FRGS



Photograph by
courtesy of
S.E.Q.E.B.

BARTON, EDWARD GUSTAVUS CAMPBELL (1858-1942), electrical engineer, was born in Melbourne, son of George Elliott Barton, a barrister, and his wife Jane Crichton (nee Campbell), and attended school in Dunedin, New Zealand. He studied engineering at Karlsruhe Polytechnic in Germany from 1875 to 1879, graduating in 1879, after which he obtained practical training in England and Scotland. In 1882 he superintended the first electric-lighting installation in Britain at Godalming, Surrey, as Siemens Brothers representative, before returning to New Zealand. Between 1882 and 1886 he was mainly engaged in consulting work in Australia and New Zealand but he also erected electrical plant for the Phoenix Gold Mines at Gympie in Queensland in 1885 and worked for the Australasian Electric Light, Power and Storage Co. In 1886 he was appointed Government Electric Engineer for Queensland with the immediate task of completing a second underground cable between the small generating plant at the Government Printing Office and Parliament House in Brisbane. This was a major undertaking because of the many short lengths of conductor and conduit required at the time.

In 1888 Barton resigned from this position and formed with C.F. White, the firm of Barton and White (later Barton, White & Co.). He brought design ability to the partnership whose main work was the manufacture of small items of electrical equipment. By mid-1888 the firm offered to supply electric light to

the public from a small direct-current generator driven by a steam engine. Shortly afterwards the General Post Office in Brisbane became the first customer but progress in extending electricity supply was slow due to the failure of equipment, floods, and opposition to new ideas. In 1896 the firm went into liquidation although it was re-formed soon afterwards as the Brisbane Electric Supply Co. Ltd. The company's first power station was in Edison Lane, off Creek Street, but by 1898 there was need for more space and the plant was moved to Ann Street. In 1904 the company changed its name to City Electric Light Co. with Barton as General Manager and Director. Several years later he resigned and was appointed a consultant to the company. In 1915 he went to England, joining the staff of the Department of Munitions and later the Naval Information Department, partly on account of his ability to speak French, German and Italian. A major interest, which commenced in 1922, was the British Decimal Association of which he was Chairman from 1938 until his death in June 1942.

Throughout his thirty years in Brisbane, Barton contributed a variety of technical papers to learned societies, and the range of topics indicates his very broad interests in the field of engineering. They included wireless telegraphy which he demonstrated in a public lecture in Brisbane in 1903. His views on electric railways were advanced and he described in a lecture to the Queensland Electrical Association in 1901 the advantages of alternating-current over direct-current traction systems, outlining their application to south-east Queensland. Barton's activities in the development of professional societies in Queensland were outstanding. In 1892 he was elected to the Council of the Queensland Institute of Mechanical Engineers, and in 1898 the Queensland Electrical Association was formed with Barton as a founding member and President for 1899-1900. The Queensland Institute of Engineers was formed in 1901 with Barton as President for 1901-2. From 1907 to 1915 he was local honorary secretary for the Institution of Electrical Engineers.

Barton showed an interest in politics and in 1908 he was elected MLA for North Brisbane. However he did not seek re-election in the following year. There is much evidence of his interest in technical education and he conducted classes in electrical engineering subjects before a technical college was created in Brisbane. Later, in 1905, he became President of the Council of the Brisbane Technical College. Barton's interest in the establishment of a University is evident from his inaugural address to the Queensland Institute of Engineers in 1901. He advocated strongly that the University Senate should be "recruited chiefly from recognised scientific, industrial and commercial associations". He was appointed to the first Senate in 1910 and made Chairman of the Buildings and Grounds Committee.

Barton married Mary Allen Sutton in 1893 in Brisbane and they had one son, Joseph George Elliott Barton.

Jour. Inst. Elec. Engrs, Vol. 90 (1943), Pt. 1, p. 531;
S.A. Prentice, 'Electricity in Early Brisbane', Qld Div.
Tech. Papers, I.E. Aust., Vol. 22 (1982), No. 19;
S.E.Q.E.B. Archives.

(SAP)

3

A. A. BOYD

MAustIMM, MIMM, MAIME



Photograph by
courtesy of
Q.G.M.J.

BOYD, ADAM ALEXANDER (1866-1948), mining engineer, was born at Eastwood near Glasgow, Scotland. Educated at the Glasgow Technical College he was articled to Dixon and Marshall, civil and mining engineers, and at the age of twenty-two was granted his certificate as a coal mine manager. He migrated to Australia, becoming Assistant Mine Manager of the Bellambi Colliery near Newcastle in 1891 and in 1893 was appointed to a similar position at the Newcastle Wallsend Colliery. In 1898 he was appointed Mine Manager for the Broken Hill Proprietary Company Limited, then Australia's premier mine. During his thirteen years at Broken Hill, Boyd revolutionized mining practice at the "Big Mine". He devised better methods of square-set timbering and introduced water curtains for combating underground mine fires. In 1911 he returned to coal mining at the Wallsend Colliery.

In 1913 Boyd was appointed General Superintendent of Mount Morgan Gold Mining Company Ltd's mine in central Queensland and in 1915 became General Manager of the company. Mount Morgan was to be his life until his retirement. Prior to his arrival at Mount Morgan the large, open, underground stopes had resulted in serious rockfalls so that costly square-setting with fill was necessary to combat "the creep" in the mine. Wartime shortages of equipment and a fixed price for copper further limited the mine's

profitability. During and after the war the company was plagued by many strikes, costs continued to rise and Boyd proposed a 20 per cent cut in all wages, salaries, and directors' fees in order to keep the mine going, but when this was rejected the operation was closed. On resumption, a year later, there were further industrial problems, a collapse in the underground workings and rowdy mob demonstrations, culminating in an underground fire in September 1925, which closed the mine; a subsequent flood, in 1928, filled the stopes. Boyd remained calm throughout and, with the aid of an American expert, proposed a scheme of open-cut mining. Its expected profitability was doubtful, the company was liquidated and subsidiary companies and moveable assets were sold.

A recent historian has written:

The worst excesses of mob action had closed the Mount Morgan mine. Now self-sacrifice and co-operation were to set it back on its feet. Adam Boyd was not a man to be beaten, the dour Scot with dogged determination put his faith and funds into the mine...in a seemingly futile bid to achieve prosperity. *

In July 1929 Mount Morgan Ltd was formed with a subscribed capital of 85,000 pounds to reopen the mine; Boyd was a director and consulting engineer, refusing a fee for the latter position. In 1930 he became manager at 10 pounds per week but depression conditions and low copper prices compounded the new company's problems. Boyd visited the USA and was convinced modern flotation processes could treat the Mount Morgan ore. Eventually funds were found in loans from the Commonwealth and State governments and the new processes put to work. The result was excellent, the shareholders raised funds, government loans were repaid and the first dividend was paid in December 1933. The rest of the 1930s was spent in developing the open-cut and in expansion; Boyd retired as General Manager in 1935, remaining on the board of directors. Boyd then managed Mount Morgan Developments Ltd, a company with prospecting areas in various parts of Australia, New Guinea and Fiji, but unfortunately without success. Mount Morgan Ltd continued to prosper, expanding its open-cut, installing new plant and resuming copper smelting. Boyd became Chairman of Mount Morgan Ltd in 1938, retiring in 1941, at the age of seventy-five, after twenty-eight years' service with the two companies.

"In his relations with the men, his humanity and sense of justice seldom if ever erred and in consequence he earned their respect and co-operation", was said of Boyd by the President of The Australasian Institute of Mining and Metallurgy, on the occasion of the presentation to him of the Institute's highest honour, its Medal, in 1941.

Boyd died in Brisbane on 16 December 1948. He and his wife had two daughters and a son. He is remembered as the saviour of Mount Morgan.

'Adam A. Boyd', Q.G.M.J., Vol. 51 (1950), pp. 479-80;
ADB, Vol. 7, pp. 370-71, * John Kerr, 'Mount Morgan:
Gold, Copper and Oil' (Brisb, 1982).

4

A. B. BRADY

MInstCE



Photograph by
courtesy of
Alcazar Press.

BRADY, ALBERT BARTON (1856-1932), civil engineer, architect and departmental head, started his pupilage as an architect in 1872 with the Lancashire and Yorkshire Railway Co. and spent seven years on railway work, two years with a consulting engineer on gasworks, waterworks and drainage and four years as engineer to sanitary authorities in East Anglia before emigrating to Queensland in October 1884.

In March 1885 he joined the Railway Department, then very active in main-line construction; in 1887 he was made the first Assistant Engineer for Bridges and in 1889 was invited to be the Engineer for Bridges in the Department of Public Works. The great floods of the early 1890s brought many urgent jobs, including the repair of the Fitzroy River suspension bridge at Rockhampton, and the replacement of important bridges at Brisbane, Maryborough and Gympie. The new Victoria Bridge at Brisbane was the third-longest metal-truss road bridge in Australia when it was opened in 1897; it was replaced in 1969 but the Burnett River Bridge and the Kennedy Bridge, both at Bundaberg are similar in design and still in service. His Lamington Bridge at Maryborough, the first reinforced-concrete bridge built in Australia, is one of the notable series of low-level bridges designed using lessons from the floods.

In August 1891 the architectural and the engineering branches of the Department were amalgamated under Brady and in April 1892 he was confirmed

in the position of Government Architect and Engineer for Bridges, but it was not a happy department, and in 1900 it was investigated by a Royal Commission consisting of the Chairman of Committees and four back-bench members of Parliament. There was remarkably frank evidence from some of the 107 witnesses; Brady received some criticism, but the Commission accepted his opinion that the Department should be drastically reorganized, and on 1 February 1901 Brady was given the additional position of Under Secretary, and he directed the Department for the next twenty-one years. Although the Department built many bridges in the late 1890s very few were started afterwards, partly as a result of the increasing strength of the rural local authorities, but apparently no need was seen for road bridges, nor was any money available. The only two important road bridges, a low-level bridge near Yelarbon on the Dumaresq River, and a steel truss on the McIntyre River at Goondiwindi, were built on the state border with New South Wales.

Before 1914 the Department built many new buildings for the Commonwealth, including the fine customs houses at Townsville, Mackay, and Rockhampton, the large post offices at Rockhampton, Ipswich and Stanthorpe, and the Enoggera army camp. Many schools were built and there were new needs after 1910, when the Government established technical schools, the university and the first state high schools. The former Executive Building (finished in 1906) and the Administration Building (completed in 1920) show the transition to a new style of official architecture. By 1920 the Department had many other responsibilities such as the supervision of the electric light and gas companies, the inspection of machinery and scaffolding, and the supervision of local authority loan works, the most important of these being the construction by the Metropolitan Water Supply and Sewerage Board of sanitary sewerage for Brisbane where there were great difficulties, especially in an attempt to drive a low-level tunnel along an ancient bed of the Brisbane River. In 1921 the Government referred the project to a Royal Commissioner, who absolved Brady from blame.

Although trained as an architect and claiming that he always advised on "arrangement, style, and materials", it appears that his senior assistant, Thomas Pye, supervised the detailed design; Brady's main professional interest was in engineering, the Institution of Civil Engineers publishing four of his papers between 1895 and 1903, and awarding him Telford Premiums and the Crampton Prize for two of them. He was ambitious, but his contemporaries had no doubt about his ability as a designer and he was an excellent administrator. It was fortunate for Queensland that at a time of rapid change, the Department was led by a man with great professional ability, wide experience, and able to work in many fields. Brady retired on 1 February 1922, his sixty-sixth birthday, and he moved to Sydney where he died on 31 May 1932, predeceased by his wife but survived by a daughter and seven sons.

ABD, Vol. 7, pp. 385-6; Min Proc. Inst. Civ. Engrs, Vols 121 (1894-5), 124 (1896), 141 (1900), 151 (1903); R.S. Brodribb, 'Road Needs', Qld Div. Tech. Papers, I.E. Aust., Vol. 10, No. 19 (1969); V&P (LA Qld), 1900, Vol. 3, p. 979, 1913, Vol. 3, p. 611, 1921, Vol. 2, p. 924.

(ELR)

5

JOSEPH BRADY

MinstCE



Photograph by
courtesy of
Miss E. L.D.
Brady.

BRADY, JOSEPH (1828-1908), designer and builder of railways, water supply and harbours. Born near Enniskillen in north Ireland on 18 August 1828 and apprenticed on his thirteenth birthday to his father as a surveyor, he was just twenty-two when he arrived in Sydney in 1850, with five and a half years' experience on railway location and construction.

From the time of his arrival he filled various senior positions and after 1857 he was always in sole charge. His first job was as assistant to the Engineer of the Sydney Railway Co., which had recently been formed to build and operate the line to Parramatta; initially on survey and design he was Resident Engineer during construction after 1851. In 1851 Brady spent six months in Victoria, surveying and drafting for the Yan Yean scheme, and he returned to that Colony in 1858 as the first engineer to the Bendigo Waterworks Co; he designed a scheme to serve the goldfields, but there were funds for only one reservoir (No. 7, still in use), for the water-treatment plant and for the reticulation of Sandhurst (now Bendigo). In 1863 he managed a contract on the Melbourne-Sandhurst Railway, but resigned in order to investigate the Coliban River scheme, which is the basis of the present supply of the Castlemaine-Bendigo area.

Early in 1864 Brady was in Queensland, and he obtained a contract for the improvement of navigation between Brisbane and Ipswich (there was no rail

connection until 1875); this included underwater blasting for a channel through Seventeen Mile Rocks and for the basin at the port of Ipswich, and building a training wall at the junction of the Brisbane and Bremer rivers. He relinquished the contract in April 1864 when he was appointed Engineer to the Brisbane Board of Water Works, designing and supervising the first, permanent water-supply scheme in the Colony, including Enoggera Dam which is still in use. The work was completed in August 1866 but in January 1865 he was given an additional appointment as the first Engineer of Harbours and Rivers, responsible for all port and harbour work in Queensland, and for provincial water supplies; it included dredging in the Brisbane and Fitzroy rivers, and water-supply schemes for Bowen, Rockhampton, Maryborough and Ipswich. His Department was disbanded after the financial crisis of 1866, but Brady was retained as consultant, and in August 1867 took over for the Government the management of an unsatisfactory contract for the construction of the railway from Toowoomba to Dalby, completing the work at less than the contract price, and receiving a bonus from the Government and a civic reception and presentation from the citizens of Dalby.

Brady returned to Victoria in 1869 to manage a contract on the Melbourne-Seymour Railway but he had continued as consultant to the Bendigo Waterworks Co., and he returned to Sandhurst in 1871 to extend the work, including the construction of Crusoe Reservoir (still in service). In 1877 he was appointed the first Engineer of the Melbourne Harbor Trust, where his main task was to improve the Yarra River, and build the present Victoria Dock, the basic plan for which had been prepared by the English consultant, Sir John Coode. Brady was able to persuade the Trust to make two important changes: to develop the site as one large basin rather than three small separate docks, and to build timber wharves instead of masonry and concrete quays; this halved the cost of wharfage, reduced the time of construction, made operation easier and allowed progressive modernization of the port. Most of Brady's piling is still in place, some driven-on and lengthened to take heavier loads and capped with reinforced-concrete deck; most of the planned work was complete when he retired in 1891.

Few engineers have personally investigated, designed, constructed and operated in as many fields as Brady. The speed at which he worked is most impressive; he completed the survey and drawings for Yan Yean in six months, located and marked out two alternative rail routes between Parramatta and Mittagong in six months, and had contract work started on the dam for the Enoggera scheme less than four months after his appointment. This was fast by any standard and shows a well-informed man of vigour and decision. After retiring Brady worked as a consulting engineer and arbitrator until 1894; he died at Elsternwick, Victoria on 8 July 1908, survived by seven children.

ADB, Vol. 3, pp. 216-17; Archives, State Rail Authority of NSW; C.F. Kerr, 'The Man from County Fermanagh', P. of Melb. Q'tly, July-Sept 1965; V&P (LA Qld), 1865, p. 1295, 1866, p. 1572, 1868, p. 557; Min. Proc. Inst. Civ. Engrs, Vols. 56 (1878-9), 74 (1882-3), 159 (1905), 174 (1907-8); information from Mr K. Murley, Melbourne, Miss E.L.D. Brady, Busseton, WA, and Mr F.L. Adelaide.

Brady,
(ELR)

A. B. CORBETT

MBE, AMIEAust



Photograph by
courtesy of
Qld. Elec. &
Radio World.

CORBETT, ARTHUR BROWNLOW (1877-1970), engineer and administrator, was born in Brighton, England, on 18 February 1877 and received a part of his education at Ardingley College, Sussex. In 1890 he arrived in Australia with his parents and passed the Queensland Junior Public Examination before starting work as an apprentice at fourteen years of age. After completing his indentures, he passed the Queensland Public Service examination and was appointed as a clerk in the Money Order Branch of the GPO, Brisbane, in March 1899. In 1901 he resigned to serve in the Boer War with the Queensland Imperial Bushmen, returning as a Sergeant (and Acting Sergeant-Major) with a King's Medal and five bars. He was discharged on 5 May 1902 and three weeks later was reappointed to the Accounts Branch of the GPO, Brisbane as a clerk. By private study and departmental examinations he became an assistant engineer in 1913.

At this time Corbett carried out the first survey of telephone requirements in Brisbane and his predictions proved to be accurate ten years later. From 1914 to 1915 he was District Engineer for Rockhampton and from 1915 to 1925 Engineer in Charge of Metropolitan Line Construction, Brisbane; he gave valuable service in the Mackay area after the devastating cyclone of 1918. The talents of Corbett were becoming recognized in official circles and in 1924 H.P. Brown, Director-General of Posts and Telegraphs, commissioned him to

investigate the possibilities of mechanical mail-handling. This was the genesis of the present advanced system so widely acclaimed today.

The first machine in Australia (and, in fact, in the Southern Hemisphere) for sorting packets and newspapers was built in the postal workshops in Brisbane in six weeks from plans prepared by Corbett and under his supervision; it was installed in the Mail Exchange in December 1925. Following this success Corbett designed and commissioned larger mail-handling plants for Melbourne and Sydney exchanges.

In 1927 Corbett was appointed Superintendent of Mails, Sydney (the largest postal branch in Australia), and while in this position he introduced the alphabetical system of mail sorting in order to simplify the process. He was also instrumental in recommending amendments to the postal regulations, reorganizing the mail branches and introducing various staff-training schemes. In 1933 Corbett was appointed Deputy Director of Posts and Telegraphs in Queensland and he remained in this position until his appointment as the first Director-General of the new Department of Civil Aviation in April 1939 - a position which he filled with distinction.

During World War II he organized the conversion of all available civil aircraft to military use and at a conference at RAAF HQ on 4 March 1942, was put in charge of priorities. Later he flew to Papua to supervise the airlift of American forces and although past retirement age, his service was extended to the end of the war.

Corbett joined the Institution of Engineers, Australia in 1923 as an Associate Member and published a paper in the Journal in 1933 entitled "The Mechanical Handling of Mails, General Post Office, Sydney". He was a member of Rotary International and served as President of the Queensland Branch of the Professional Officers' Association and as an editor of their publications. In 1938 he was awarded the MBE.

"ABC", as he was known to staff in many places, was a leader of men and a devoted family man, although time with his family was often limited by the demands of public service. Determined to ensure that the public received service, he built up the morale of his staff by maintaining cordial relations with the media. As a horseman in the QIB and throughout his life he displayed a typically English concern for animals. After his retirement he established a plantation at Montville to give his sons and several other returned soldiers some experience of rural life. He married Evelyn Mary, daughter of P.J. Byrne of Brisbane on 4 October 1915 and they had four sons and one daughter. He died on 20 March 1970, aged ninety-three and is buried in the Toowong cemetery.

Records held by P.O. Museum, Brisbane; information from
Professor A.H. Corbett, Port Macquarie.

(SAP)

7

W. H. CORBOULD

MAusIMM, MIMM, MAIME, MRACI



Photograph by
courtesy of
M.I.M.
Holdings
Limited.

CORBOULD, WILLIAM HENRY (1866-1949), mining engineer and metallurgist, was born at Ballarat on 5 November 1866. He attended briefly at Ballarat College and at the Ballarat School of Mines under Professor Mica Smith, obtaining assaying and metallurgical qualifications. At the age of nineteen he obtained a job as assayer and chemist at the Pinnacles Mine near Silverton, New South Wales. He moved from there to Broken Hill in 1886, where for the next three years he was an assayer for several mines and developed his knowledge of practical geology and metallurgy. After a period at a small silver-lead mine in the Northern Territory, Corbould (later to be known by the mining fraternity as "Jimmy Corbould") went overseas through the Far East to North America studying geology and smelting. To recoup his fortunes he established a successful cosmetic business in San Francisco. In England he established connections with London mining financiers, visiting mines and studying chlorination and cyanidation. After seeing mines in Germany and South Africa he returned to Australia, where he accepted the position of Manager at the Ediacara silver-lead mine, South Australia. When this failed he joined the western gold rush in time to establish himself at Kalgoorlie, where he became a foundation member of the Chamber of Mines of Western Australia and Manager of Hannan's Reward Mine, now known as Mount Charlotte and still

a major producer. The nine years in Kalgoorlie from 1893 to 1902 were broken by a visit to England in 1896. He then consulted for twelve months for various Canadian mines before returning to Kalgoorlie. In 1903 he became Manager of Lloyd's copper mine at Burranga, near Bathurst, New South Wales, where he returned to his primary interest of base-metal pyrometallurgy.

In 1909 Corbould was appointed General Manager of Mount Elliott Ltd, near Cloncurry, Queensland, which soon became one of the most profitable copper mines in Australia. Under its energetic but unconventional manager, the enterprise returned over 400,000 pounds in dividends between 1910 and 1913. He methodically tackled the many problems that arose during the wartime copper boom and was appointed Managing Director of Mount Elliott Ltd. The post-war slump in metal prices retarded Corbould's efforts, but he retained his faith in the Cloncurry field. However by 1920 only Mount Elliott was still working, and following industrial and other problems he resigned in 1922.

As a consultant, Corbould toured the Mount Isa field in 1923. Convinced by Mount Elliott that the future of mining in north-west Queensland lay in large-scale operations, he had returned to the district brimming with enthusiasm. Noting that the ore bodies of Mount Isa resembled the silver-lead lodes of Broken Hill, Corbould secured an option on 400 acres and hurried to Sydney in January 1924 to float Mount Isa Mines Limited. As Director and General Manager, he was responsible for much of the exploratory work and the raising of capital; almost single-handed he consolidated the many leases and persuaded the Queensland Government to extend the railway from Duchess to the mines. In late 1925 Corbould attracted overseas capital from Leslie Urquhart's Russo-Asiatic Consolidated group which secured the large-scale development of the field. He resigned in 1927 and departed overseas but his faith in the area was not vindicated until 1947 when the first dividend was declared; ironically it was copper, not silver-lead, that made Mount Isa's name. After his resignation from the Mount Isa Mines Ltd board in 1927, Corbould retained his close association with mining, visiting New Guinea and other centres. It was the triumvirate of the Australian mining engineer, Jimmy Corbould, the London financier, Leslie Urquhart, and the American (later Australian) mining engineer, Julius Kruttschnitt (q.v.) who made Mount Isa one of the world's greatest mines.

Corbould and his wife had a daughter and twin sons. He died at Monte Carlo on 16 March 1949, the Ballarat School of Mines being a substantial beneficiary under his will in honour of his teacher, Professor Mica Smith.

G.N. Blainey, 'Mines in the Spinifex' (Syd, 1960); I. Hore-Lacy (ed). 'Broken Hill to Mount Isa' (Melb, 1981); ADB, Vol. 8, p. 113; information from Mr I. Hore-Lacy, Melbourne.

(IWM)

8

E. S. CORNWALL

AMIEAust



Photograph by
courtesy of
S.E.A. News.

CORNWALL, EDWARD SATCHWELL (1886-1954), engineer and administrator, was born in 1886 at Ballinacough, Roscommon in north Ireland. He was educated at Mount Morgan, Queensland, where his father was the mine paymaster for Mount Morgan Mines Ltd, and he served an apprenticeship in engineering with this company. On completion, he gained general experience in mechanical and electrical engineering with C.A. Parsons and Co., the Adelaide Tramways Trust, the Victorian Railways, the Sydney County Council and the New South Wales Railways. He was also employed as a marine engineer with Howard Smith and Co. Ltd, and the Australasian United Steam Navigation Co. Ltd. It was at this time that the late Colonel Daniel Evans (q.v.) and Cornwall formed a lifelong friendship which had an immense influence on the successful development and lasting co-operation between the firm of Evans, Deakin and Co. Ltd, and the electricity supply industry of Queensland.

In 1913, Cornwall was in Brisbane as a representative of the English firm of Willans and Robinson, overseeing the erection of the first alternating-current generating plant for City Electric Light Co. Ltd (CEL). This was at the newly-erected William Street power station and he was invited to join CEL as powerhouse superintendent. In about 1919 he was transferred to the head office and appointed Engineer for Construction. In this appointment he showed a remarkable ability to appreciate and master the operation of the whole

undertaking which comprised a substantial direct-current network, including part of the tramways system, and a rapidly developing alternating-current system. Progressively, Cornwall was appointed Chief Assistant Engineer, Assistant Manager, and in 1937, Manager of CEL. In 1948 he became a director and the following year Managing Director and Chief Engineer of the company. On the formation of the Southern Electric Authority of Queensland in 1952 he was appointed General Manager and Chief Engineer.

In the period 1930-36 Cornwall envisaged the complete electrification of south-east Queensland and put his idea to the Royal Commission which led to the creation of the State Electricity Commission of Queensland. Under his management an agreement was negotiated with the Commission for a co-ordinated electricity-supply development of coastal south-east Queensland. It included interconnection with the Brisbane City Council's system and involved the absorption of the Ipswich Electric Supply Co. and a number of country undertakings.

Cornwall guided CEL successfully through serious engineering, administrative and financial difficulties when it was expanding at a very rapid rate in the post World War II period. He foresaw the problems involved in further development of the region by a private enterprise company and his influence and initiative were most evident in the concept and structuring of the Southern Electric Authority of Queensland as a successor to City Electric Light Co. Ltd which allowed the absorption of the Darling Downs authorities and the Stanthorpe undertaking. Finally, ten years after his death, rationalization of electricity supplies in the City of Brisbane was achieved.

Cornwall was an Associate Member of the Institution of Engineers, Australia and was Chairman of Brisbane Division for 1938-9. Beyond Queensland he was recognized as an authority on electricity supply problems, and authorities in other States consulted him on projects affecting their areas. The Electricity Supply Association of Australia twice honoured him with its presidency.

Cornwall died in Brisbane in 1954, the E.S. Cornwall Memorial Scholarship being established in the University of Queensland in 1956 to honour his memory; the object is to enable graduates in engineering to obtain special experience abroad.

Southern Electricity Authority News, No. 1 (1954), p. 5;
University of Qld Calendar, 1982.

(HBM)

G. A. COWLING

BE, AMIEAust



Photograph by
courtesy of
Brisbane City
Council.

COWLING, GORDON AUBREY (1906-1975), engineer and administrator, was born in Adelaide on 10 September 1906 and graduated in civil engineering from the University of Adelaide in 1929, having lost both his parents in the Spanish-flu epidemic of 1918. Successful in amateur dramatics and variety, he was offered professional employment in these areas but elected to remain in engineering, joining the Main Roads branch of the New South Wales Department of Public Works in 1929 to assist in the supervision of the construction of the Sydney Harbour Bridge. Cowling moved to Newcastle in 1936 to work for Broken Hill Proprietary Company Limited, and in 1942 joined the staff of the Hunter District Water Board in Newcastle as Design Engineer.

The Newcastle experience in water supply and sewerage investigation and design, coupled with his former road-work experience, made Cowling an ideal candidate in November 1948 for the position of Engineer for Design in the combined Departments of Works, Water Supply and Sewerage of the Brisbane City Council at the time when a big drive was being made to overcome the backlog from the Second World War of water-supply works. It was proposed to call international tenders to amplify the trunk and distribution mains system in one gigantic contract. Cowling bore the brunt of the investigation, design and tender preparation for the many tens of kilometres of mains involved but in the

face of the 1952 downturn in the economic situation the Council had no alternative but to amplify the mains piecemeal within the limits of available funds.

At this juncture the Department of Works, Water Supply and Sewerage was subdivided and in October 1952 Gordon Cowling became Deputy Chief Engineer of the new Water Supply and Sewerage Department, followed a month later by an appointment as Engineer for Water Supply and Sewerage; the latter title was changed to Chief Engineer and Manager in 1958. In his new position Cowling was faced with a difficult situation. Not only had the financial situation deteriorated, but virtually all the Council's available capital funds had to be diverted for several years to the construction of the power-house at Tennyson. Cowling tackled the amplification of the water-supply system vigorously and adopted a priority programme for overcoming deficiencies which by 1960 virtually eliminated the risk of water shortages.

The sewerage of Brisbane had also lagged badly due to the diversion of funds to other aspects of the infrastructure, but in the early 1960s the political emphasis was switched to sewerage and Cowling was faced with the problem of developing an appropriate programme under novel and sometimes erratic financial arrangements. By the time he retired in 1972 the proportion of the city sewered exceeded 85 per cent and Brisbane had overtaken both Sydney and Melbourne.

Garden sprinkling, introduced in Brisbane in 1964 after a twelve-year ban, when combined with a large expansion of major water-consuming industries more than quadrupled the rate of growth of demand for water. Once again, Cowling had to cope with a rapid growth in the system in the face of inadequate funds, difficulties of material procurement and a simplistic administrative attitude. He was the Chairman of the Water Supply Planning Committee which recommended the raising of the level of Somerset Dam and the construction of North Pine Dam as sources of increased water supply for the Brisbane system, and he was a member of the Moreton Regional Water Advisory Committee which recommended the building of Wivenhoe Dam on the Brisbane River.

Having served a record twenty-year term as head of the Council's Department of Water Supply and Sewerage, the accumulated years of strain exacted their toll and he died on 9 September 1975 within a relatively short time of retirement, leaving a wife, a son, and a married daughter.

Based on a personal knowledge of Cowling and discussion
with colleagues.

(GC)

W. J. CRACKNELL

MSTE



Photograph by
courtesy of
Telecom Aust.

CRACKNELL, WILLIAM JOHN (1832-1896), pioneer telegraph engineer, was born in London and migrated to New Zealand in 1855. Later he came to Queensland where he was appointed Telegraph Station Master for Ipswich in April 1861, following the completion of the first telegraph line in Queensland - from Brisbane to Ipswich. He advanced to the position of Superintendent of Electric Telegraphs for Queensland in November 1863, his elder brother E.C. Cracknell being Telegraph Superintendent for New South Wales at that time. The appointment was made permanent in 1865.

Due to Cracknell's initiative there was a remarkable development of the telegraph system over the next seventeen years. Lines were extended to distant parts of Queensland, first to the commercially-important seaports along the coast and then inland to the western, central, north and north-west areas. This was an accomplishment requiring courage, determination and skill in coping with an environment hostile to men and inimical to materials. His close personal interest in the extension of the telegraph system is evidenced from an inspection trip he made in 1865 which took 175 days, involving travelling over 10 000 km by land and water. This was also the year in which the first submarine cable in Queensland was laid between Brisbane and Cape Moreton via Cleveland, and Stradbroke and Moreton islands.

Cracknell was most anxious to have the cable terminal of the proposed telegraph service linking Australia to England located in Queensland and in 1871, as a preliminary step, he secured approval to extend the Queensland system from Cardwell to the Gulf of Carpentaria. Further, he personally inspected the proposed route by riding the 700 km between these places. In the event the cable terminal was located in Darwin and in 1872 direct telegraphic communication between Europe and Queensland was achieved via Darwin. Because of the frequent breakdowns of the international service, Cracknell pressed for an additional cable and in 1877 he strongly recommended that Queensland should assume the whole responsibility for laying a cable from the north coast of Queensland to Bangkok at a cost of about one million pounds.

He was clearly interested in the introduction of newly-developed equipment. In 1876 he installed Wheatstone's automatic (paper band) instruments in Brisbane to improve the speed of transmission between Brisbane and Sydney where they were already in use. The initial difficulties were overcome a year or so later. In his report for the year 1877 he refers to "some very interesting experiments with the Telephone...at my office on 26th January (1878)....The instruments used on this occasion were roughly manufactured in Brisbane and not well adapted for the purpose....Professor Bell, the inventor of the Telephone, is sending me two of his improved instruments and, on their arrival, further experiments with this scientific wonder will be made."

In 1878 a minor threat of war in Europe resulted in the setting up of the Torpedo and Signalling Corps in Queensland of which Cracknell was gazetted Captain. In the same year the new telegraph office was opened in Queen Street and it is recorded that by this time the eight stations existing when he was appointed had increased to 148. However, soon afterwards the Postal and Telegraph branches were amalgamated and it seems that he was unhappy with the change which required him to channel correspondence and reports through the Under Secretary of the new Department. In 1880 he resigned and moved to New South Wales where he turned to rural interests. In the same year the first telephone exchange in Queensland was opened in the Brisbane Post Office.

Cracknell was a Member of the Society of Telegraph Engineers, London, which in 1888 became the Institution of Electrical Engineers. He married a Miss Hair and there were two daughters, the family living at Annerley on a 20 ha property where Cracknell Road is named after them; he died in Sydney in 1896.

P.J. Gribble, 'What hath God Wrought' (Telecom Aust., 1980); M.M. Rea, 'Centenary of the Brisbane GPO' (Brisb, 1972); V&P (LA Qld), Annual Reports to the Postmaster-General up to 1879.

(SAP)

A. E. CULLEN

ISO, MInstCE



Photograph by
courtesy of Mr
E. B. Cullen.

CULLEN, ALEXANDER EDWARD (1861-1950), harbour engineer, was born in Brisbane on 21 December 1861 and educated there. He began his long association with the Queensland coast in 1878 as a Civilian Assistant with the Admiralty Coast Survey, in HMS "Pearl". When the commission was completed in 1880, he worked for six months on railway surveys in north Queensland, and then became an assistant to J.B. Henderson (q.v.) on water-supply investigation in Brisbane and in western Queensland. Resigning for health reasons in 1882, he did six months contract surveying for the Lands Department and then joined the Department of Harbors and Rivers as a nautical surveyor. He worked as far north as the Gulf of Carpentaria before transferring in 1890 to the Department of Ports.

In 1893 Cullen became Nautical Surveyor and Engineer to the newly-formed Marine Board which had absorbed the Department of Harbors and Rivers. It was a time of financial depression with little money even for maintenance, and much of Cullen's time was spent surveying the Brisbane River to find the cheapest way of restoring the shipping channels which had been obliterated by the great floods of 1893. In 1896 he removed a major restriction to the port by blasting a cut, 1.5m deep, through the Lytton Rocks at the river mouth. He also prepared a scheme for the improvement of the river upstream to Victoria Bridge which involved extensive dredging, the construction of training walls,

and the easing of sharp bends in the upper reaches. He aimed at reducing both the amount of maintenance dredging and the height of river floods by forming the largest possible channel which would be swept clean by the tidal flow. Apparently the design was intuitive, based on his intimate knowledge of the river, and it proved very successful when completed many years later.

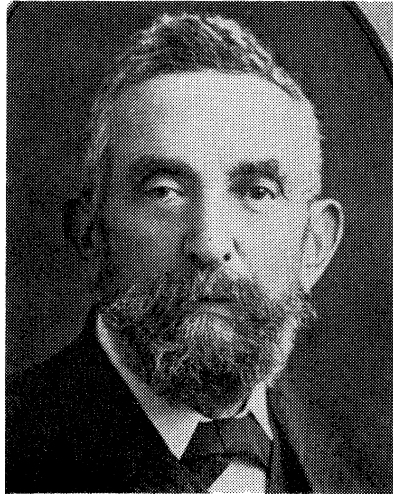
In 1902 Cullen was appointed Engineer for Harbors and Rivers in a re-organized Department, and he was sent on a study tour of the USA. In 1908 work was begun on a new 6.5 km long approach channel, from Moreton Bay to the river mouth, and after Cullen visited England in 1910 more dredging plant was purchased, including the very successful dredge "Remora". In 1912 a start was made on the construction of the river training walls and the reclamation of the tidal flats behind them which have since been developed. Cullen made Brisbane a most successful river port, with a deep-water channel some 25 km upstream from the mouth. After the 1930s overseas trade moved downstream towards the Hamilton area but the river was adequate for the heavy wartime shipping and it was not until the 1970s that it was necessary to build a new port at the mouth of the river. Although Brisbane was the chief port throughout Cullen's career there are some twenty gazetted ports in Queensland, and Cullen had a great influence on their development, either directly or by technical advice and supervision of loan expenditure for the larger ports such as Townsville and Gladstone which were controlled by local boards.

Cullen's ability was widely known; in 1912, with the Chief Engineer of the Sydney Harbour Trust, he reported on the development of a new harbour at Napier, New Zealand, and for some years he represented Australia on the Council of the Institution of Civil Engineers. He gave papers to the Institution on the removal of the Lytton Rocks and the improvement of the Port of Brisbane, being awarded a Telford Premium for the latter. He also contributed to the discussion of other papers describing the construction of training walls and Queensland's experience with dredges. In all his practice he maintained that "no man could be considered a competent Harbour Engineer unless he had a knowledge of the sea, and of ships, gained by experience", for he held that theoretical knowledge was no substitute for practical experience. *

Cullen was awarded the ISO in 1930; he retired in 1931 and worked for some years with his son, E.B. Cullen, who had established a consulting practice in harbour and civil engineering. He died in Brisbane on 13 April 1950, predeceased by his wife and survived by his son and daughter.

ADB, Vol. 8, pp. 167-8; Jour. Inst. Civ. Engrs, Vol. 34 (1950); Min. Proc. Inst. Civ. Engrs, Vols 142 (1899-1900), 202 (1915-16), 203 (1916-17), 214 (1922); G. Lewis, 'The Ports of Queensland' (Brisb, 1973); * Jour. I.E. Aust., Vol. 41 (1969), p. 72; G.R.C. McLeod, 'Dredging the Brisbane River, 1860-1910', JRHSQ, Vol. 10, No. 3 (1977-78), pp. 137-148; information from Mr E. B. Cullen, Brisbane.

(E.L.R.)

R. T. DARKER

Photograph by
courtesy of
Qld. Railways.

DARKER, RICHARD THOMAS (1837-1921), goldminer and engineer, was born on 18 July 1837 at Kettering, England. He was educated at Peterborough and at sixteen was apprenticed as a fitter to the London and North Western Railway at Wolverton. On completion of his indenture he moved first to Turners in London, spent a short time in the tool shop at Woolwich Arsenal and then joined the London, Chatham and Dover Railway for a period before setting sail for Australia. He arrived in Melbourne by the "Empress of the Sea" on 8 August 1861 aged twenty-four.

Darker was suffering from gold fever and almost immediately sailed to New Zealand where rich strikes were reported. After a short time he returned to Melbourne and worked on the Victorian fields as a digger where he had experience with winding engines and other mining machinery. After about two years he moved to Sydney and then to Brisbane intending to continue his gold search in Queensland. He passed through Ipswich in 1864 where he received an offer of work from Abraham Fitzgibbon, the Chief Engineer of the embryonic Queensland Railways, and he entered the service of the Government in September 1864, being put to work on the Bremer River rail/ road bridge. He suffered a short retrenchment when teams of men, recruited in England, arrived but was soon engaged on erecting locomotives, carriages and other rolling-stock as they arrived from England.

With the extension of the line westward, he was sent to Dalby in 1868 as leading hand in charge of the locomotive shed but was brought back to Ipswich in 1870 as leading fitter and made foreman of shops two years later. In 1875 he was sent to Toowoomba as foreman, returning to Ipswich after a year. All the locomotives had been imported up to this time but in 1878 three units were built in the Ipswich shops from spares and shop-constructed boilers and frames. This work was carried out under Darker's direct supervision.

In 1879 Darker was a witness before a select committee enquiring into the operation of the Ipswich workshops; it reported favourably on the quality of work produced and on locally-trained tradesmen but recommended greatly improved facilities and equipment. In 1883 Darker was made Locomotive Superintendent, Southern and Western Railway and in 1890, Locomotive Superintendent of Railways. In 1898 he was sent to New Zealand to study the operation of the railways and he visited workshops in Auckland, Wellington, Christchurch and Dunedin; he was to have extended the visit to include southern Australian states but he was recalled to give evidence before a court of enquiry into two boiler explosions. As a result boiler inspection procedures were tightened and no further explosions occurred. In 1900 he was made Outdoor Superintendent and Locomotive Superintendent for the Queensland system and was transferred to Brisbane. On leaving Ipswich he was given a farewell and presentation by railway employees and by the citizens of Ipswich. In 1910 Darker was appointed Locomotive Engineer but he retired in the same year at the age of seventy-three after forty-seven years of service.

Darker took an active part in community life in Ipswich and became the first superintendent of the Ipswich Fire Brigade in 1878. He was a member of the State Schools' Committee, the Ipswich Fire Brigade Board in 1884, the Department of Mines Board of Examiners for Engine Drivers in 1906, and the Railway Appeal Board in 1910. He was associated with the Ipswich Gas Co., Ipswich Woollen Mills, Ipswich Building Society and Stafford Brothers' collieries.

In 1866 Darker married Williamina Forbes, a migrant from Scotland, and they had a family of six sons and six daughters; he died in Brisbane on 9 July 1921.

V&P (LA Qld), 1879 (2nd Sess.), Vol. 2, p. 535, 1899 (1st Sess.), p. 627; Qld Govt Blue Books; Qld Govt Gazette to 1910; Brisbane Courier, 11 July 1921; Qld Times, 14 July 1910; information from family records, Mr J.F. Jeffcoat, Qld Railways, and Mr G.E. Bond, Aust. Rlws Hist. Soc. (Qld Branch).jl

(WIG)

13

COLONEL D. E. EVANS

MBE, DSO, MIEAust, MINA, MASME



Photograph by
courtesy of
Evans Deakin
Industries
Ltd.

EVANS, DANIEL EDWARD (1885-1951), shipbuilder, engineer and soldier, was born on 8 May 1885 at Geelong, Victoria, the fifth son of Charles Herbert Evans, described as a mariner and jack-of-all-trades. Charles moved to Bundaberg, Queensland and Daniel attended the Boys' Central School which he left in 1899 at fourteen to be an engineer apprentice at Bundaberg Foundry.

The family moved to Adelaide where Daniel became a draughtsman but soon shipped as an engineer on the cable-ship "Restorer". He studied for his chief engineer's certificate and in 1906 gained a second class Board of Trade certificate at the age of twenty-one. He returned to Adelaide and gained his chief engineer's certificate in 1908 while working for the Adelaide Steamship Co. Evans called frequently at Brisbane and saw a need for an enterprising firm of engineers there. In 1910 he and twenty-three year old Arthur Deakin opened a small business in Edward Street as suppliers of engineering equipment. They acquired their first workshop in 1913.

In December 1912 Evans was commissioned as Second Lieutenant in the Australian Militia. He joined the AIF as a Lieutenant in the 2nd Divisional Engineers in July 1915 and served in Egypt and France. By the time his active service was terminated by wounds in February 1918 he was a Major, had been

mentioned in despatches and awarded the DSO in the New Year Honours of 1917. Contacts made while on leave in England later secured his appointment as a non-exclusive surveyor in Brisbane for Lloyds. He also joined the Institution of Engineers and Shipbuilders in Scotland. In 1924 Evans became Lieutenant-Colonel commanding the 5th Division, Australian Engineers and in 1930 Colonel commanding the 11th Infantry Brigade. He was awarded the Volunteer Officers' Decoration in 1931.

The business was carried on during the war by Deakin and had prospered although the workshop had been lost. Evans started a new workshop, making small pieces of equipment in an outbuilding of his Coorparoo home in 1919. He pioneered the introduction into Queensland of both oxy-acetylene and electric-arc welding. A larger establishment was bought in 1922 and one of the first contracts was for three hundred wagons for the Queensland Railways. A new, larger workshop, built at Rocklea for structural steel and railway engine repairs in 1926, was ready to manufacture the steelwork for the Story Bridge in 1933. Joining M.R. Hornibrook, he chaired a new construction company which erected the bridge.

Evans was in uniform again at the outbreak of World War II as Chief Engineer, Northern Command. He was also appointed Chairman of the Board of Area Management, Queensland, under the Ministry of Munitions and this work won him an MBE. In addition he established the Evans Deakin shipyard at Kangaroo Point and he personally supervised the earlier work where a 1200 tonne lighter, laid down on 27 July 1940, was the first of seventeen naval and merchant ships built in wartime. The last of eighty-one ships built in the yards was launched in 1971. He served as a director of Mount Isa Mines Ltd, Cossey Motors Pty Ltd and Tableland Tin. He was energetic, forceful and gregarious and, as an old trade unionist, was apolitical. He looked after the welfare of his men and had little industrial trouble.

Evans was an Associate Member and a Foundation Member of the Institution of Engineers, Australia, serving on the first Council in 1921; he achieved the status of Member in 1924. He was one of the first members of the Professional Engineers Registration Board and also belonged to the Institution of Naval Architects and the American Society of Mechanical Engineers. He was on the Board of the Faculty of Engineering of the University of Queensland from 1921 until his death; he left a substantial bequest to the University and is commemorated by an annual lecture.

In 1908 Evans married Kathleen Mary, daughter of Kimberley pioneer Michael (Stumpy) Durack and they had one son and four daughters. He retired in 1948 and died in Brisbane on 1 December 1951.

ADB Vol. 8, pp. 445-6; information from Public Relations
Dept, Evans Deakin Industries Ltd.

(WIG)

14

A. J. GOLDSMITH

MInstCE



Photograph by
courtesy of
his family.

GOLDSMITH, ALFRED JOSEPH (1848-1928), engineer and manager, son of Joseph Goldsmith, was born in London on 19 September 1848. His family having emigrated to Australia in 1854, he was educated in Sydney and after a course of private tuition he entered the works of Messrs P.N. Russell and Co., engineers and shipbuilders of Sydney, New South Wales, and served an apprenticeship of six years with that firm. He then remained as mechanical designer and draughtsman for a further three years, during which time he was engaged on the design of railway rolling-stock, industrial machinery and dredges.

In 1871 Goldsmith entered the Harbours and Rivers Department of New South Wales, under E.O. Moriarty, and was engaged, with F.T. Rose, on the design of a double-ladder dredger for the Port of Newcastle. He joined the Harbours and Rivers Department of Queensland in August 1874, on the invitation of F.T. Rose, who was by then Engineer for Harbours and Rivers, and in December of that year, on Rose's death, he was appointed Assistant Engineer, taking charge of the Department until the arrival six months later of the new Engineer in Chief, W.D. Nisbet. While in Queensland he designed and supervised the construction of two large steam hopper-barges and various other vessels, and he also had charge of improvement works on the Brisbane and Mary rivers. He superintended the construction of dredging plant to the value of 140,000 pounds and furnished reports, estimates and plans for numerous works,

among which may be mentioned the Government wharves at Petrie Bight, wharves at Bundaberg, Maryborough and Cooktown, and the graving dock at South Brisbane.

Resigning his appointment in 1881, he became managing partner of John Walker and Company (afterwards Walkers Ltd,) engineers and shipbuilders of Maryborough, with which firm he remained until 1892, when he practised privately in Brisbane. In 1903 he rejoined Walkers Ltd and remained with the firm as a director until his death, being engaged principally upon the building of dredging plant and steam vessels. At the same time he was occupied with various other interests, being consulted by numerous State departments and authorities. He superintended under A.B. Brady, the Under secretary for Works, the construction of bridges over the Mary and Burnett rivers. For his paper "The Burnett and Kennedy Bridges, Bundaberg, Queensland" he was awarded a Telford Premium by the Institution of Civil Engineers. As Chief Engineer of the Bundaberg Harbour Board he laid out and supervised the construction of training-walls in the Burnett River, and he acted as Chief Engineer and later as consulting engineer to the Rockhampton Harbour Board. He was for several years the special advocate for the Iron Trades Employers' Association on the Board of Trade and Arbitration, and in 1898 he was appointed a member of a committee set up to enquire into the safety of locomotives.

Goldsmith was elected an Associate of the Institution of Civil Engineers in 1879, and transferred to the class of Member in 1883. He served for a number of years as Honorary Secretary and Treasurer, and later as Chairman of the Advisory Committee of the Council in Queensland; he was the Representative Member of the Council in Australia from 1916 to 1918.

In 1873, he married Sarah, daughter of Stephen Forster of Sydney. He died in Brisbane on 4 June 1928, being survived by his widow, three sons and a daughter.

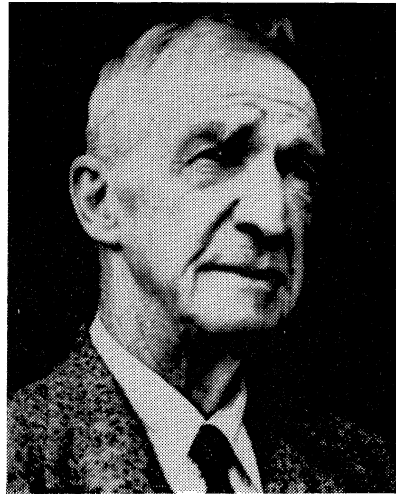
Min. Proc. Inst. Civ. Engrs, Vol. 228 (1930), pp. 350-51.

(W.I.G.)

15

PROFESSOR R. W. H. HAWKEN

ME Syd., BA Syd., MICE, MIEAust



Photograph by
courtesy of
Miss P.
Hawken.

HAWKEN, ROGER WILLIAM HERCULES (1878-1947), engineer, educator and administrator, son of Nicholas Hawken, was born in Sydney on 12 May 1878. He was educated at Newington College and Sydney University where he graduated in Civil Engineering in 1900 with First Class honours; he also completed an arts course, graduating in 1902.

Hawken's early working life was notable for the breadth of experience gained which included four years as assistant and later as acting executive engineer in the service of the British Government in the Malay States. After his return to Australia in 1909 he held a position as Shire Engineer in New South Wales for two years when he was invited by Professor Warren to lecture to engineering students at Sydney University. During this period he applied to the University of Queensland for a position as lecturer in civil engineering and was appointed in 1912.

When the Dean of Engineering, Professor Gibson, was called for service in World War I, Hawken was appointed Acting Professor and Dean of the Faculty. He became Chairman of the Queensland Institute of Engineers and Secretary of the Institute of Local Government Engineers of Australia. In addition, he found time to produce a thesis on column analysis and design which won him the

degree of Master of Engineering. On his return from war service Professor Gibson resigned his Chair and recommended that Hawken be appointed in his place. His appointment in 1919 met with wide approval and the high status achieved by the Faculty is testimony to his success. He was elected to the Senate of the University in 1920 and 1923 where his ability and gift for clear thinking made him a very useful member during a period marked by growth and development of the University.

These years coincided with the amalgamation of the various engineering societies throughout Australia in the foundation of the Institution of Engineers, Australia. In this foundation Hawken took a prominent part. He represented the Queensland Institute of Engineers at the conference which decided on amalgamation and was the representative of the Institute of Local Government Engineers on the Provisional Council set up to draft a constitution for the new Institution. He was a member of the Council from its first meeting in October 1919 until his death in 1947, holding the position of Vice President in 1921 and 1922 and President in 1923. In 1920 he was Chairman of the Brisbane Division and a member of the Divisional Committee from that time onwards. In 1931 the Institution awarded him the Peter Nichol Russell Medal.

Hawken was a Member of the Institution of Civil Engineers, to which he contributed papers on column design. He was a member of the Australian Association for the Advancement of Science and Chairman of the City Council Cross River Commission. In 1931 he was consultant to the Government of Tasmania on the Derwent River bridge. He held many appointments to the Queensland Government including a consultancy on the Story Bridge design and was their representative on the Councils of the Standards Association of Australia and the National Association of Testing Authorities.

Hawken was a member of the teaching staff of the University of Queensland for just over thirty-five years and occupied the Chair of Engineering and the office of Dean of the Faculty continuously for almost twenty-nine years. During this long period he served the University, the State of Queensland and the profession of engineering with distinction, his courtesy and tact, his technical knowledge and his wide experience of men and affairs being invaluable. He was a prolific writer and produced innumerable papers on technical subjects.

In 1911 Hawken married Adelaide Margrette Mott of Black Mountain in New South Wales and they had a family of five daughters; he died in Brisbane on 15 October 1947.

A.T.M. Stoney, 'Professor Roger Hawken', University of Qld Gazette, December 1947, p. 4; information from Miss P. Hawken, Brisbane, and University of Qld Archives.

(W.L.G.)

16

J. B. HENDERSON

MInstCE, MASCE



Photograph by
courtesy of Mr
I.L. B.
Henderson.

HENDERSON, JOHN BAILLIE (1836-1921), water engineer. Born in London of Scottish parents, he migrated to Victoria with his parents in the early 1850s, and was trained as a civil engineer on the construction of the Melbourne-Geelong Railway (c.1857) and worked with the Roads and Bridges Department. In 1863 he became the first engineer of Alberton Shire in Gippsland, resigning in 1866 to work with the Water Supply Department in the Central Highlands where he completed the Coliban Scheme (now greatly enlarged). He was District Engineer in the Sandhurst (Bendigo) and Castlemaine areas on Black Wednesday, 9 January 1878, when he was dismissed with over 200 senior civil servants after the Legislative Council had refused Supply to the Government.

Henderson immediately moved to Queensland, and in April was appointed Resident Engineer for Northern Waterworks in the Department of Harbors and Rivers under W.D. Nisbet (q.v.). In 1879 he was given charge of all waterworks under construction in the Colony, and in 1881 he was appointed State Hydraulic Engineer and head of a new Water Supply Department. It was a time of major drought, and much of his time was spent providing water on stock routes in the far west where earth tanks were dug and water sought by shallow boring. The first Australian artesian water was found near Bourke, New South Wales, in 1879, and following exploration by R. Logan Jack (the Government Geologist),

the Department placed a contract in 1885 for deep drilling at Blackall. The plant was unsatisfactory and in 1887 Henderson arranged for the Canadian contractor who had just finished the first successful Queensland bore (near Cunnamulla) to drill at Barcaldine, where flowing water was reached in December at about 200 m depth. The extreme importance of artesian water was soon realized and Jack and Henderson worked together to define the basin, which covers about two-thirds of Queensland. There was much drilling for the Department and the station owners but by 1890 it was clear that most of the water was being wasted and that the flow from many bores was diminishing. Henderson, with Jack's support, urged that all artesian water be controlled by the Government, but a Bill he drafted was rejected by the Legislative Council in 1891. Control was not obtained until 1910 following the visit of the famous American irrigation engineer, Dr. Elwood Mead. The Act was designed to give control without unnecessary restriction, but the Department became the target of "unsparing criticism" from "those(who wished)... to return to the system of uncontrolled license which they had so long enjoyed". Incidental to the boring programme was the first hydro-electric power plant (on the Thargomindah bore in 1896) and the discovery of natural gas at Roma (1900).

Concurrent with the development of rural water supplies, the Department supervised all town water-supply schemes built with loan funds; the large provincial towns submitted projects for approval, but the Department designed and supervised the construction of many of the smaller schemes such as those at Charters Towers and Gympie.

After the heavy flooding from 1887 to 1893, Henderson installed flood gauges along the Brisbane, the Mary and the border rivers, and established the present methods of forecasting and issuing forecasts of flood heights. He prepared flood mitigation proposals for Brisbane, Gympie, and Maryborough but it was not until 1909 that he received approval to employ hydrographers and initiate regular stream-gauging.

Henderson's Annual Reports, containing detailed accounts of the artesian basins (including isopotential maps) and diagrammatic charts of rainfall, indicate his scientific interests. He took over the Weather Bureau from 1903 (when the disappointed Clement Wragge left Queensland) until the first Commonwealth Meteorologist was appointed in 1908; it was the intention of the Government to continue rainfall measurements only, but as a break in the records would be "a public calamity" he continued all Wragge's work except the forecasts. Queensland's water-supply and irrigation schemes are based on Henderson's work; hardworking and forthright, his Annual Reports gave generous thanks to his staff. When he retired in 1916 in his eighty-first year they thanked him for his "firm but just rule". Henderson died after a short illness on 15 February 1921, and was survived by his wife, a daughter, and two sons.

ADB, Vol. 4, p. 377; Qld Govt, Water Supply Dept, Ann. Reports; information from Mr. I.L.B. Henderson, Redland Bay, Qld and Mr I. McD. Thompson, Alberton Shire Engineer, Vic.

(E.L.R.)

H. HORNIBLOW

Photograph by
courtesy of
Qld. Railways.

HORNIBLOW, HENRY (1841-1910) engineer and railwayman, was born on 5 April 1841 at Bransford, Worcestershire, England, the son of Job Freeman Horniblow (described as a miller) and Mary Ann Parry. At the age of fourteen he was apprenticed as a fitter to the London and North Western Railway at the Wolverton Works. He completed his indenture in five years, serving six months in the drawing office, nine months in the machine shop and the remainder of the time in the erecting shops, partly on repairs but mainly on new work. On completion of his indenture he worked for two years as a journeyman and two years as a draughtsman.

Horniblow gave up that position to accept an appointment in Queensland arranged through Sir Charles Fox, consultant to the Queensland Railways. He was engaged in London in June 1864 to go to Queensland as foreman in charge of tools, but on arrival at Ipswich in November 1864 he found that too many foremen had been engaged for the work in hand; rather than return to England he accepted work as a journeyman. After three years he was appointed locomotive foreman in Toowoomba and held that position until the end of 1875 when he was transferred to Ipswich as Locomotive Foreman of the much bigger shops there. He held that position until appointed Locomotive Superintendent, Southern and Western Division, in 1876. In 1871 he visited railway workshops in Adelaide, Melbourne, Sydney and Tasmania on behalf of his employers and in

1879 when giving evidence before a select committee enquiring into the operation of the Ipswich workshops, he stressed the need for enlarged and better-equipped facilities to cope with the work-load involved in maintaining efficient operation of the railway system.

In 1883 Horniblow was appointed Locomotive Engineer with responsibility for general supervision over all district offices throughout Queensland. This involved his transfer from Ipswich to Brisbane where his duties included advising the Department on requirements for new locomotives and rolling-stock, the preparation of drawings and specifications and the letting of contracts for their construction. At first all locomotives were imported from England or America but in 1887 the first specification was issued for locally-built locomotives and a contract was let to the Phoenix Engineering Co. of Ipswich for constructing fifteen units. Horniblow was the engineer responsible for this change in policy.

In 1899 Horniblow gave extensive evidence before a court of enquiry into two boiler explosions in railway locomotives. In answers to questions he stated that he was not satisfied with the condition and equipment of the existing workshops for handling the demands of increasing traffic but that ground-plans had been prepared for improvements which were already being put into effect. Later in the year he was made Assistant Chief Mechanical Engineer but in 1900 he was granted leave of absence to make a private tour of England and the continents of Europe and America to study the administration of railway mechanical departments. On his return he resumed his service as Deputy Chief Mechanical Engineer but when that position was discontinued in 1904 Horniblow reverted to his former position of Locomotive Engineer and held that office until his death.

Wherever he was stationed Horniblow took an active part in community affairs. In Toowoomba he was one of three responsible for the establishment of the successful Railway Friendly Society and he occupied the position of Superintendent of the Fire Brigade. In Ipswich he was a member of the Fire Brigade and was also appointed by the Government to the State Schools Committee of North Ipswich; in 1892 he became President of the Queensland Institute of Mechanical Engineers. For his personal qualities he was always highly esteemed by his staff and his many friends inside and outside the railway service.

In 1866 he married Jenneth Spinks at Ipswich and had a family of eight, of whom five survived to adulthood; he died in Brisbane on 4 February 1910.

V&P (LA Qld), 1879 (2nd Sess.), Vol. 2, p. 535, 1899 (1st Sess.), p. 627; Qld Govt Blue Books; Qld Govt Gazettes to 1910; Brisbane Courier, 7 February 1910; information from Mr J.F. Jeffcoat, Qld Railways and Mr G.E. Bond, Aust. Rlways Hist. Soc. (Qld Branch).

(WIG)

18

J. S. JUST

MIEAust, MIEE, MAIEE



Photograph by
courtesy of
Qld. Elec. &
Radio World.

JUST, JOHN STEPHENS (1880-1962), electrical and mechanical engineer, was born in Adelaide, South Australia and was educated at St. Bartholomew's Church of England Grammar School, Adelaide University, and the School of Mines and Industries. He gained early experience at Mort's Dock and Engineering Co. in Sydney before joining the Sydney Municipal Council electricity undertaking as an Assistant Engineer in 1904. In 1915 he joined City Electric Light Co. Ltd (CEL), in Brisbane as Chief Assistant Engineer, the Manager and Chief Electrical Engineer being E.J. Cochrane. Just served as Engineer and later as Manager from 1917 to 1928. The CEL power-station in William Street had begun operating in 1911 and the first alternating-current generators were commissioned in 1915. During a period of rapid development of the supply system Just had a major responsibility for the transmission and distribution of three-phase alternating-current supply in south-east Queensland, including a three-phase 33,000 volt transmission line from Brisbane to Ipswich which was the first of its kind in Queensland. It is clear that United States' practice was adopted but no facilities for pre-testing typical assemblies were available at this time.

Just took an active part in the formulation of rules for electric wiring and in 1919 was a delegate to the National Conference of the Standing Committee

on Uniform Wiring Rules. This Conference made the recommendation that the Rules should be known as the Wiring Rules of the Institution of Engineers, Australia. In the early 1920s the Queensland Government appointed him to the Tramway Valuation Board which was valuing the assets of the Brisbane Tramways Co. Ltd. At the time, the company was supplying over half the energy requirements of the Brisbane area.

By 1924 the William Street power-station had an installed capacity of 23 MW but the site had serious limitations for further development. Just advised against expansion and selected a new site at Doboy Creek for the construction of Bulimba power-station, which allowed ample cooling water and convenient transport of coal. At the same time Just was associated with the design and construction of a new power-station at Rockhampton and in 1926 he submitted a scheme for the electrical development of south-east Queensland which was accepted almost in its entirety ten years later by the Royal Commission on Electrical Development in the State.

In 1928 Just opened an electrical and mechanical engineering practice in Brisbane and ran it until his death. During this period he was for ten years Chairman and Managing Director of the Roma Electric Light and Power Co. and a consultant to a number of country electricity authorities in Queensland and northern New South Wales as well as to several industrial undertakings. During World War II he was commissioned to investigate the production of electrolytic hydrogen as a substitute fuel. *

Just was a member of the Queensland Institute of Engineers and was actively concerned with the foundation of the Institution of Engineers, Australia. He was appointed to the Provisional Council and from 1919 to 1937 served on the elected Council. He served on the newly-formed Brisbane Division Committee, being Chairman in 1921-2 and 1928-9. He also represented the Institution of Electrical Engineers in Queensland from 1948 to 1962, having served on the Queensland Overseas Committee from its inception in 1930. In 1934 Just was elected President of the Royal Society of Queensland and his presidential address reviewed the previous fifty years of scientific research and its commercial application, especially in the field of engineering. In 1950 he was made a Life Member of the American Institute of Electrical Engineers. He was also interested in the registration of engineers and was a member of the Board of Professional Engineers from its inception until 1935. As a member of the Faculty of Engineering in the University of Queensland for thirty-five years, Just took a keen interest in the establishment of a separate Department of Electrical Engineering in 1950 and in its subsequent development.

Just died in September 1962, being survived by his wife and two daughters.

Presidential Address, Royal Society of Qld, Vol. 47
(1936); Qld Elec. and Radio World, Aug. 1936; * Jour.
Inst. Elec. Engrs, Vol. 91 (1944), Pt. 1, p. 383.

(SAP)

SIR JOHN KEMP

Hon. MEQld, MInstCE, MIEAust



Photograph by
courtesy of
Main Roads
Dept, Qld.

KEMP, JOHN ROBERT (1883-1955), civil engineer and administrator, was born at Yendon, Victoria, on 6 October 1883. Educated at state schools and privately, he started a degree course at the University of Melbourne but completed his professional training from 1905 to 1906 with the Public Works Department. He joined the Commonwealth Patent office as an Assistant Examiner and in March 1910 became the Karkaroc Shire Engineer in north-west Victoria. The Shire thought him a "rattling good officer", and was proud when in October 1913 he became the second engineer appointed to the staff of the newly-formed Victorian Country Roads Board.

Kemp came to Queensland in October 1920 as the first Chairman of the Main Roads Board. The first task was to gain the co-operation of the shires, and within two years the Board had travelled from Coolangatta to Cooktown and into the west, meeting councillors, explaining the new Act to them, and allaying their fears. Kemp selected J.E. England, who had a good background in the Queensland Public Service, as Secretary/ Accountant and the technical staff came largely from Queensland Railways and the Lands Department, with young graduates from the University of Queensland.

The Act stated that the first need was for roads from "farm to railway station", and there were major technical problems in climbing the steep coastal

scarps and crossing the black soil of the Darling Downs. In these early days of motor transport the first research done by the Board was the effect of vehicle tyres on road pavements. Kemp dominated the Board, and in 1925 he had the Act amended to make him the sole Commissioner of Main Roads. His field widened in 1932 when he became Chairman of an interdepartmental committee within the Bureau of Industry, set up to find suitable public works to relieve unemployment. As a result he became chairman of the River Bridge Board (which brought J.A. Holt to Brisbane to design the Story Bridge), the Stanley River Works Board (formed in 1934 to build the Somerset Dam under the direction of W.H.R. Nimmo (q.v.)) and of the University Works Board (which developed the present site at St Lucia).

In January 1939 Kemp was given an additional appointment as the first Co-ordinator General of Public Works, responsible for planning and co-ordinating the State's works programme. In 1942 he was also made Deputy Director-General of Allied Works and he used the facilities already under his control, together with the new Civil Constructional Corps, to build urgent war-works, including Cairncross Dock, 250 km of new road from Mount Isa to Tennant Creek and some fifty strategic airfields. After the war the Co-ordinator General's Department absorbed the Bureau of Industry; Holt and Nimmo became, respectively, the Chief Engineers of the Structures and the Hydraulics Branches of the Department which built major rail and road bridges, dams, and hydro-electric projects throughout Queensland, and continued with construction at St Lucia. Kemp also became Deputy Chairman of the Queensland-British Food Corporation from 1947 to 1953 which opened up the brigalow lands of central Queensland. He stood down as Commissioner of Main Roads in 1949, and in January 1954 he was succeeded by Holt as Co-ordinator General.

Kemp was able to do so much for Queensland because he combined a strong character with wide interests and sound engineering judgement and, although his ambition was to do everything himself, he was good at delegating executive authority. His pioneering work with the Main Roads Commission gave him both a thorough knowledge of Queensland and the confidence of the Government, which turned to him for advice on all engineering matters from the registration of professional engineers to the re-organization of electricity supply. He had the respect and admiration of his staff, mixed with awe and a wry amusement. He was Chairman of the Brisbane Division of the Institution of Engineers, Australia, in 1924 and 1925 and President in 1931. In 1942 he was awarded both the Peter Nichol Russell Memorial Medal of the Institution and the Kernot Memorial Medal of the University of Melbourne. From 1944 to 1955 he was a member of the Senate of the University of Queensland.

Sir John, who was made Knight-Bachelor in 1951, died in Brisbane on 28 February 1955; his first wife died in 1952, and his second wife, whom he married in 1954, survived him; he had no children.

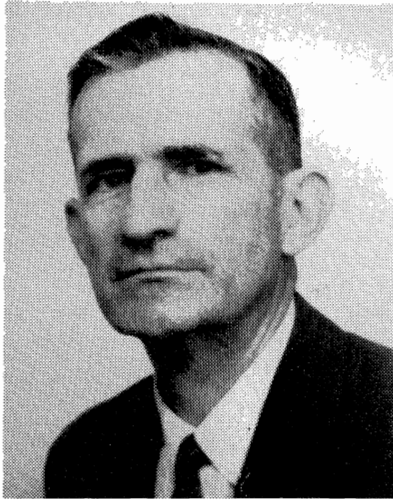
C. Lack, 'Three Decades of Queensland Political History' (Brisb, 1959); A.J. Wheeler, 'Sir John Kemp', Planner Vol. 18, No. 2 (1978); information from Mr. R.A. Boyd, Karkaroc Shire Engineer, Victoria, the C.R.B., Victoria, discussions with former colleagues and personal recollections.

(ELR)

20

J. E. KINDLER

MEAdel., FIEAust



Photograph by
courtesy of
Mrs S. K.
Kindler.

KINDLER, JOHN ERNEST (1906-1968), structural engineer and chief engineer of a multi-purpose department, was born at Nuriootpa, South Australia, on 20 October 1906. After graduating at the University of Adelaide he wrote a Masters thesis while helping to supervise the construction of the Sydney Harbour Bridge. In 1932 he joined the New South Wales Department of Main Roads, and in 1934 was appointed a senior assistant engineer with the Bridge Board which had just been formed to build the Story Bridge in Brisbane under the direction of J.A. Holt (later Sir James Holt) the Supervising Engineer.

After the completion of the bridge in 1940 Kindler worked on projects of the Allied Works Council in north Queensland, under J.R. Kemp (q.v.). After the War Kemp formed the Engineering Office of the Co-ordinator General's Department from the staff of the Bridge Board and the Stanley River Works Board, with Holt as Chief Engineer of the Structures Branch and W.H.R. Nimmo (q.v.) as Chief Engineer of the Hydraulics Branch. For some thirty years this Office acted as engineering consultant to the Queensland Government and was given direct responsibility for a great variety of civil engineering projects; with first choice of candidates for the engineering scholarships then being offered by the State it developed into an elite organization.

Until 1949 Kindler was Principal Designing Engineer (Structures) with the Department, but when Nimmo was appointed Commissioner for Irrigation and Water Supply Holt was made Chief Engineer of the Department, with Kindler Deputy Chief Engineer (Structures) and E.M. Shepherd Deputy Chief Engineer (Hydraulics). In 1954 Holt succeeded Sir John Kemp as Co-ordinator General, and Kindler became Chief Engineer of the Department.

Until the 1970s the Structures Branch was responsible for most of the large bridges built in Queensland, for the structural work at the new St Lucia campus of the University of Queensland and for a wide range of special studies including (in 1951) the first engineering investigation of erosion of Queensland beaches. Many of the bridges included new techniques in design and construction; for example, the Burdekin rail road bridge and Indooroopilly rail bridge were the first to use high strength bolts in place of rivets and to have the decks designed to act with the lower chords of the trusses. Kindler was the ideal leader in these jobs; thoroughly trained by Holt in design, he kept himself informed on overseas developments and had the confidence and courage to criticize in public accepted design practice. Furthermore, he would accept the ideas of others, "provided they passed his rigorous analytical examination"; this trait was especially valuable when he also had responsibility for the Hydraulics Branch which, after the completion of Somerset Dam was responsible for the Tully Falls and Barron Falls hydro-electric schemes and other projects in north Queensland. Under his leadership the Department was constructing authority for over ten projects, ranging from the construction of the Weipa township to the dredging of the Brisbane River to accommodate new oil refineries.

Kindler was committed to the advancement of his profession; six of his technical papers were published by the Institution of Engineers, Australia; with co-author W. Hansen he was awarded the Warren Memorial Prize in 1957 and he also received the Warren Memorial Prize and R.W. Chapman Medal in 1958. He was Chairman of the Queensland Division of the Institution in 1955, and was active in the founding of the Association of Professional Engineers of Australia and in the preparation for the landmark "Professional Engineers' Case" of 1957-61. He did much for engineering education; he was closely associated with the University of Queensland through personal friendship, co-operation in many technical investigations, and as a member of the Engineering Faculty Board; he played a very important part in the founding of the Queensland Institute of Technology, which named the Kindler Memorial Theatre and the John Kindler Memorial Prize in his honour.

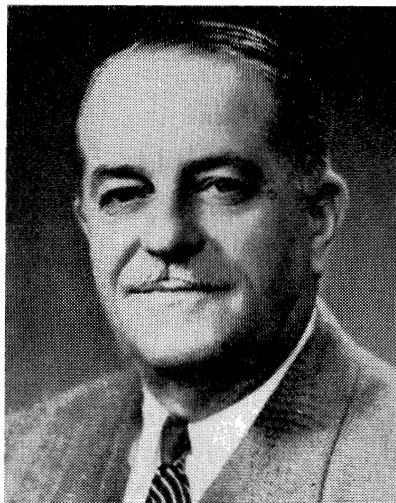
Stern in appearance, scrupulous in all things, sympathetic but a somewhat hard taskmaster, he earned the respect of his staff by his sincerity. John Kindler died at his desk on the morning of 25 June 1968 (the day he was to be appointed to succeed Sir James Holt), leaving his wife and two married daughters; his passing at the height of his powers was a very great loss to his family, his friends and to Queensland.

Annual Reports, Co-ordinator General's Department (esp. 1964-65); 'Author and Subject Index of Publications, 1920-1968' (I.E.Aust, 1969), p.45; information from Mrs. S.K. Kindler and former colleagues.

(ELR)

JULIUS KRUTTSCHNITT

DEngQld, BA Yale, Hon. MAusIMM, FIMM, MAIME



Photograph by
courtesy of
M.I.M.
Holdings
Limited.

KRUTTSCHNITT, JULIUS (1885-1974), mining engineer, was born at New Orleans, Louisiana, USA on 7 May 1885. He attended Yale University, graduating in 1906 with the degree of Bachelor of Philosophy. He started his mining career as a mine surveyor at Morenci, Arizona, with the Arizona Copper Company. In 1909 he joined the Mining Department of the American Smelting and Refining Company (Asarco) as Superintendent of the Reforma lead mine in the State of Coahuila, Mexico. Later he was moved to the State of Aguascalientes as Superintendent of the mine Santa Francisca, a silver mine located near the village of Asientos. He was transferred to El Paso, Texas, as field engineer for Asarco becoming Manager of their Mining Department of the South-West with headquarters in Arizona.

In September 1930, Asarco (who controlled the company) offered Kruttschnitt the appointment of General Manager of Mount Isa Mines Limited and he accepted. His task was to rescue the ailing mine from complete collapse; he set about it with such zeal that the first ore was lifted from the mine in 1931 and within six years the company showed its first net profit. Kruttschnitt was appointed a director of Mount Isa Mines Limited in 1932 and became Chairman of the Board of Directors in 1937. He retired from the

chairmanship of Mount Isa Mines in May 1953 but remained on the Board as a director until 1967.

A bare recital of Kruttschnitt's association with Mount Isa and Mount Isa Mines Limited (today M.I.M. Holdings Limited) does not capture the greatness of this physically small man, who braved the daunting tasks of isolation, mine flooding, bedrock metal prices, limited cash resources and ever-increasing demands for capital, and won. It was Kruttschnitt's determination, backed by American support, that brought Mount Isa to success, paying its first dividend in 1947. In the years succeeding World War II, with his successors he developed Mount Isa into the world's largest single producer of lead and silver and among the major producers of copper and zinc.

Kruttschnitt was a kind and courteous person, a "gentle man" in every sense of the word. He was welcome and at home in all circumstances, from his game of bowls with the mine blacksmith to receptions with the greatest in the land. He was twice President of the Australasian Institute of Mining and Metallurgy, and was awarded its Medal in 1946. The Institution of Mining and Metallurgy awarded him its Gold Medal in 1960. He was President of the Queensland Chamber of Mines for fourteen years from its inception. He served as a member of the Board of the Faculty of Engineering at the University of Queensland from 1954 to 1962 and the honorary degree of Doctor of Engineering was conferred on him by the University in May 1971.

The Julius Kruttschnitt Mineral Research Centre was presented to the University of Queensland by M.I.M. Holdings Limited in 1971 to honour Dr Kruttschnitt. He made a generous personal donation which established the Julius Kruttschnitt Education Fund whose purposes include the provision of scholarships and other financial assistance to undergraduates in mining and metallurgy courses in Queensland, and contributions towards the expenses of the annual Julius Kruttschnitt Lecture, held each year in Brisbane. Mount Isa's second domestic water supply source, the Lake Julius Dam, is named after him. He became an Australian citizen in 1965.

A much loved and most eminent Queensland engineer, he died on 23 September 1974, at the age of eighty-nine. He was twice married and was survived by two sons and two daughters by his first marriage.

G.N. Blainey, 'Mines in the Spinifex' (Syd, 1960); Proc. Australas. Inst. Min. Metall., No. 253 (Mar. 1975), p. 1; Bull. Australas. Inst. Min. Metall., 468 (Oct. 1982), pp. 17-21.

(IWM)

22

W. M. E. L'ESTRANGE,

AMIEAust, MIEE, FCIS Lond.



Photograph by
courtesy of Wn
Brooks & Co.

L'ESTRANGE, WILLIAM MANDERVILLE ELLIS (1868-1951), electrical engineer and administrator, was born in Dublin on 11 December 1868, son of Edgar William L'Estrange and Mary Frances Henderson. He was educated at Arnold House, Chester, England and came to Australia in 1886. From 1887 to 1893 he was engaged in surveying work first as an assistant to the Logan District Surveyor, C.D. Dunn, and later working independently. During this period he also farmed in the Beechmont area. In 1893 he contemplated returning to Ireland, but decided to accept employment with a relative, E.G.C. Barton (q.v.) of the electrical firm of Barton and White, (later Barton, White and Co.) of Brisbane. Three years later when aged twenty-eight, he left the firm to seek overseas experience. He attended courses in England at University College and Finsbury Technical College in London and also in Cologne, Germany. The next two years were spent with the General Electric Co., concluding with installation work in San Francisco.

On returning to Brisbane in 1900 L'Estrange became Secretary of the Brisbane Electric Supply Co. Ltd which with a capital of 2,000 pounds had succeeded Barton, White and Co. Following the reconstruction of the company a further change of name to City Electric Light Co. (CEL) was made in 1904. In 1912 L'Estrange became Joint Manager and Engineer of the company, a position he retained until 1915 when he retired to become Chairman of the Queensland State Repatriation Board. He returned to CEL in 1920 as Joint

Governing Director and was a director until 1938. The Ipswich Electric Supply Co. was formed in 1917 and from then until 1927 L'Estrange was the Secretary. He was a director from 1927 and, from 1933 to his retirement in 1938, Chairman of Directors. This company was associated with CEL and purchased energy in bulk from it. During his periods of service with the Brisbane Electric Supply Co. and CEL there was a very great increase in the use of electricity. In 1900 the number of consumers was perhaps 200; in 1935 there were over 18,000 and the power demand had increased two hundred-fold.

L'Estrange was a member of the Queensland Electrical Association which had been formed in 1898 "to promote the general advancement of electrical and telegraphic science...". When this Association merged with the Queensland Institute of Engineers in 1911 he became the first President of the enlarged organization. Prior to this he was a member of a committee of the Association set up to consider reasons for the slow development of the electric light and power industry. A particular difficulty was that the Queensland Electric Light and Power Act of 1896 followed English practice in requiring that electricity mains be underground. This was preventing economic reticulation in situations where overhead mains were regarded by the industry as appropriate.

At a meeting of the Queensland Institute of Engineers in May 1914, a sub-committee was set up to discuss the need for improved roads in Queensland. L'Estrange, as a member, favoured the creation of a Department of Highways to control the making of all roads in the State. The formation of a Main Roads Improvement Association seems to have resulted from the discussions and a Main Roads Board was later set up.

For a few years prior to 1919 there had been discussions about the benefits of forming a national society for professional engineers to replace State bodies. In 1918 a decisive step was taken at a national conference and in August 1919 the Institution of Engineers, Australia was formed. L'Estrange was a founding member and became Chairman of the Brisbane Division for 1933-4. His retiring chairman's address is a valuable record of the history of electricity supply in Queensland. He represented the Institution of Engineers, Australia on the Great Barrier Reef Committee and was its Honorary Treasurer. He was also Honorary Secretary and Treasurer of the Queensland Committee of the Institution of Electrical Engineers from about 1914 to 1934.

L'Estrange was very interested in the development of the University of Queensland and was appointed a member of the Senate in 1927. He became Chairman of the Buildings and Grounds Committee in 1928 and was Warden of the Standing Committee of Council from 1922 to 1927. He continued his Senate appointments until 1935.

He married Mary Emmeline Alder, daughter of E.H. Alder, Chief Inspector of Public Works for Queensland, in March 1900 and they had a son and three daughters; he died on 20 December 1951.

'Queensland and Queenslanders' (Brisb, 1936); W.M.E.
L'Estrange, 'The History of Electricity Supply in
Brisbane', in S.E.Q.E.B Archives, No. 103.

(SAP)

23

C. B. MOTT

M.E.Qld, MIEAust



Photograph by
courtesy of
Mrs R. M.
Wylie.

MOTT, CHARLES BANKS (1896-1967), municipal engineer, was born at South Brisbane on 1 November 1896, graduating in 1919 with First Class Honours at the University of Queensland. His initial experience was with consulting engineers, the Lands Department, and the Main Roads Board. After qualifying as an Authorised Surveyor in 1923 he became the Assistant City Engineer of the South Brisbane City Council and in 1925 the first Designing Engineer of the newly-formed Greater Brisbane City Council where he set up the design office and prepared the standards and specifications for a vigorous programme of road construction and storm-water drainage within an area of some 1000 sq km. From 1928 he also acted as a District Engineer and in 1934 he was seconded to the Stanley River Works Board to assist W.H.R. Nimmo (q.v.) in the design of Somerset Dam, including the township and the construction plant, as well as the mass-concrete dam itself.

Mott returned to the Brisbane City Council in 1937 and was appointed Deputy City Engineer in 1938. In 1940 he also acted as Construction Engineer to the Co-ordinator General of Public Works (J.R. Kemp, q.v.) for the Bowen Bridge Road overbridge, which was built conjointly with major street-regrading at South Brisbane and the straightening of Breakfast Creek, all of which he designed.

In 1940 the Council was reorganized and the City Engineer's Department was expanded to include water supply and sewerage under a new City Engineer; Mott was made Designing Engineer in the new department at a time when Brisbane was being turned into the supply base for the South Pacific War. In 1942-43 he was seconded to the Allied Works Council as Resident Engineer for the construction of the army base and freight transfer depot at Wallangarra. On returning to the Council in 1943 his work included the design of filtration plant at Mount Crosby and preparing for post-war expansion. In 1945 he was put in control of the Works Branch at a time of great activity; 550 km of road was built in 1946; there was much mechanization, and Mott developed one of the largest asphalt plants in Australia, using high-speed pavers to place asphalt on concrete bases.

In 1952 water-supply and sewerage reverted to a separate department and Mott became Engineer for Works in the reorganized Department of Works, with direct control of a very large labour force and much plant, and of the administration of major contracts. There was a rapid spread of estates developed by private subdividers, who used design specifications set and administered by his Department. In 1958 his title was upgraded to Chief Engineer and Manager, Department of Works.

Mott retired in 1962 after thirty-nine years' service to the city which he saw grow from a population of about 240,000 to 600,000; the keys to his lifelong work were his integrity, his loyalty to the Council and his continued interest in engineering; his steadfast attitude was that the Council was responsible for the care of its own property, and that all improvements in private property should be at the expense of the owner. No one has had more influence on municipal engineering in Brisbane; as Chief Engineer and Manager he kept in close touch with all technical matters, meeting his branch heads and their staffs regularly. He was a member of the Local Government Engineers Board of Queensland and the standards he developed for Brisbane were copied throughout the State. He regarded design as of first importance, but had a pragmatic attitude to what could be done with the money available, and he took this attitude to the lectures on structural engineering which he gave at the University in 1943-45 and after he had retired.

Charlie Mott always took a personal interest in his staff, looking after their interests in the frequent reorganizations which afflicted the Council. He joined the Institution of Engineers, Australia, as an Associate Member in 1924, and transferred to Member (now Fellow) in 1946; he was Chairman of the Brisbane Division in 1949 and Councillor of the Institution in 1950 and 1951. Mott died in Brisbane on 29 August 1967, leaving a wife, a daughter and a son.

Jour. I. E. Aust., Vol. 14 (1942) pp. 177-89, Vol. 24 (1952), pp. 162, 163, 187; G. Greenwood and L.J. Laverty, 'Brisbane 1859-1959' (Brisb, 1959); Information from Mrs R.M. Wylie and former colleagues and personal recollections.

(ELR)

24

W. M. NELSON

ACGI Lond., MIEAust, MIEE, AMICE



Photograph by
courtesy of
Brisbane
Grammar
School.

NELSON, WILLIAM MUIR (1871-1926), electrical engineer, was born at Loudoun station, Dalby, on 5 October 1871, the son of Hugh Muir Nelson (later Sir Hugh, Premier of Queensland). He received his early education at Toowoomba Grammar School and later at Brisbane Grammar School. In 1891 he became a junior draughtsman in the locomotive department of the Queensland State Railways and from 1892 to 1893 he served part of an apprenticeship with the locomotive workshops of the New South Wales State Railways.

In 1894 Nelson commenced an electrical engineering course at the Central Technical College, London, and on completion in 1897 became an Associate of the City and Guilds Institute, London (later Imperial College). His first professional appointment as an electrical engineer was in Scotland as Assistant Mains Superintendent in the Electric Lighting Department of the Edinburgh Corporation. This was followed by appointments in 1900 as Assistant Engineer with the Greenock Corporation Electricity Supply and from 1901 to 1902 as Chief Engineer and Manager.

In 1903 he returned to Australia and accepted an appointment as Chief Assistant Engineer with the Brisbane Tramway Co. Ltd with responsibility for

the construction and maintenance of power plant, overhead structures, track and rolling-stock. In 1908 he transferred to the Electricity Supply Department of the Sydney Municipal Council as Chief Assistant Engineer in charge of power supply and distribution.

In 1909 when the Launceston Municipal Council was planning a new tramway system, Nelson assisted with the design and specifications and also supervised construction. His next appointment was in 1910 in New Zealand as Chief Engineer to the Christchurch Tramways Board and he remained in this position until 1913 when he returned to Brisbane as Chief Engineer to the Brisbane Tramways Co. Ltd. It followed a period from 1909 to 1913 during which no extension had been made to the tramway system.

In 1922 the Brisbane Tramways Trust was created and on 1 January 1923 it took over the ownership and control of the system from the tramway company, Nelson becoming Acting General Manager and Chief Engineer of the Trust. When in 1925 the tramway system was handed over by the Trust to the new Brisbane City Council, the management and engineering responsibilities were separated and he was designated Chief Engineer, Tramways Department.

Nelson took a keen interest in professional society activities. He was a member of the Queensland Electrical Association, and gave his first paper to the Association in 1904. He became President in 1906 and his presidential address on "The Education of Electrical Engineers" showed a keen appreciation of the problems involved and gave positive guidance to their solution. He was a member of the Queensland Institute of Engineers and President for 1915-16. In 1919 he and J.S. Just (q.v.) represented the Institute on the Provisional Council of the Institution of Engineers, Australia, and in 1920 (and again from 1923 to 1926) he represented the Brisbane Division on the newly-formed Council. In 1926 he was elected Chairman of the Brisbane Division.

Nelson was a member of the Road Construction Standing Committee of the Institution of Engineers, Australia, the Town Planning Association of Queensland, the Cross-River Commission, and the Engineering Standards Association. He had a close association with engineering education as President of the Council of Brisbane Technical College and as an Honorary Lecturer from 1915 to 1926 in the Faculty of Engineering in the University of Queensland. From 1907 to 1908 he was a trustee of Brisbane Grammar School.

He died suddenly in Brisbane on 5 October 1926 and was survived by his widow, a son and two daughters.

'Brisbane Grammar School Annals, 1869-1922' (Brisb, 1923); Brisbane Courier, 6 October 1926; Trans. I. E. Aust., Vol. 7 (1927), p. 681; J.E. Morwood, 'History of Electric Tramways in Brisbane', Qld Div. Tech. Papers, I.E. Aust., Vol. 11 (1970), No. 1; correspondence with Inst. Civ. Engrs, London;

(SAP)

25

J. M. NEWMAN

CBE, BESyd, MAusIMM, MIMM



Photograph by
courtesy of
Aus. I.M.M.

NEWMAN, JAMES MALCOLM (1880-1973), mining engineer, was born at Caboolture, Queensland, and educated at the Brisbane Grammar School and the University of Sydney. Upon graduation at the age of twenty, he worked in a succession of mines near Gympie, smelters at Newcastle and mines in Broken Hill as a miner, assayer and surveyor. In 1904 he went to the Peak Hill goldfield in Western Australia becoming in turn surveyor, geologist, mining engineer and then General Manager at a salary of a thousand pounds a year, before he was twenty-seven. In 1908 he was engaged firstly as consulting engineer and later as Senior Mine Engineer by the Mount Morgan Gold Mining Co. Ltd. During the next four years Malcolm Newman (as he was generally known) was involved in problems of underground mining methods. His paper on the "Geology of Mount Morgan and Area" in conjunction with G.F. Campbell Brown, was the authoritative work for many years. In 1912 Newman commenced practice as a consultant, visiting the Yodda goldfields in Papua and then the alluvial tin-fields of Malaya. There he saw the "promised land" and with his associates, the Pratten brothers, he prospected, developed and floated a number of highly successful tin-dredging companies. With F.G. Pratten he formed, in 1923, Alluvial Tin (Malaya) Ltd with a capital of 20,000 pounds. In 1927 this company and its associates were sold to a London group for 750,000 pounds. His prospecting activities in this period also extended into Thailand, Burma and Borneo.

In Australia Newman's love of the land and cattle was the basis for his interest in properties in the Northern Territory, notably at the vast station of Anthony's Lagoon, and in Queensland where he had a prime stud of Aberdeen Angus. He was a strong proponent of the use of fertilizers to improve pastures and personally converted much low-grade country in the Queensland coastal area into good grazing land. At heart he was always a "bush cocky".

In the early 1930s, again with Pratten interests, Newman became involved in alluvial gold-prospecting in New Zealand, erecting large dredges on the west coast of the South Island. Later in the same decade he turned his attention to the alluvial-tin deposits in the Cairns hinterland and successfully promoted Tableland Tin Dredging N.L. whose successor forty years later is still mining in the same locality.

In World War II Ginger Newman ("Ginger" because of his red hair) was Controller of Minerals Production for the Commonwealth Government, waiving the proffered salary and accepting only reimbursement of expenses. He directed the effort to develop the production of minerals and metals for the Australian war effort and to supplement supplies of strategic materials for the entire Allied programme. For this work and for his contributions to the Australian mineral industry he was awarded the CBE in 1957. In 1939 Newman had become a director of Mount Morgan Ltd, the successor to the Mount Morgan Gold Mining Co. Ltd, and in 1949 he became its Chairman, serving until his retirement in 1962 at the age of eighty-two. During his period as a director and Chairman he spent much time in promoting the use of Mount Morgan pyrite for the manufacture of sulphuric acid and fertilizers.

Newman was always interested in mining education; in his early days he sat on the Board of the Mount Morgan Technical College and in the late 1940s he was one of the principal instigators of the mining engineering school of the University of Queensland.

In 1961 Malcolm Newman was presented with the medal of the Australasian Institute of Mining and Metallurgy. The citation read:

In recognition of his long service to the mineral industries, in particular gold and copper mining in Western Australia, Queensland and New Zealand and tin mining in Malaya and Australia, and for his national service in many fields of primary industry.

He was a product of Queensland and Mount Morgan who did much for the State and the great mine. Newman died on 23 November 1973; he was twice married and was survived by two daughters and six sons.

'Who's Who in Australia' (Melb, 1950), p. 535; S. Tuttle,
'Caboolture Country' (Caboolture, 1973); Pamphlet,
Australas. Inst. Min. Metall., July 1961; John Kerr,
'Mount Morgan: Gold Copper and Oil' (Brisb, 1982);
personal recollections and family reminiscences.

(IWM)

W. H. R. NIMMO

CBE, DEngQld, MCEMelb, Hon.FIEAust, FICE, FASCE



Photograph by
courtesy of
Mrs A. E.
Wickham.

NIMMO, WILLIAM HOGARTH ROBERTSON (1885-1970), hydraulic engineer (investigation, design and construction). Born in England of Australian parents on 10 February 1885, he graduated at the University of Melbourne in 1908, and in 1964 was awarded the first Doctorate in Engineering of the University of Queensland on the basis of his published papers.

After initial experience as a draftsman and engineering surveyor in Victoria, New South Wales, and Queensland he joined the Tasmanian Public Works Department in 1913 where he designed the State's first concrete-arch dam and the first reinforced-concrete bridge. In 1918 he joined the new Hydro-Electric Department, worked out the hydrology of the Great Lake and, as Resident Engineer, constructed the Liawenee diversion canal from the Ouse River to the Lake. He also began a lifelong practice of using investigations at construction sites to solve current theoretical design problems.

Nimmo moved to Brisbane in 1924 as Civil Engineer to the Metropolitan Water and Sewerage Board. In 1927 he became Designing Engineer of the Main Roads Commission, then in its formative years under (Sir) John Kemp (q.v.). In 1933-34 he was a member of a Bureau of Industry committee investigating the water-supply and flood-mitigation requirements of Brisbane. He completed the

investigation almost single-handed in about fifteen months using for the first time in Australia, it is believed, unit-hydrographs and flood-probability studies combined with a flood-plain map of Brisbane for the economic assessment. As a result the Stanley River Works Board was established in 1934 to construct the Somerset Dam and Nimmo was seconded from the Main Roads Commission, first as Designing Engineer and later as Chief Engineer. Innovations in design and construction included measures to prevent hydraulic uplift, and hydraulic model studies of dissipator and sluice gates.

In 1942 Nimmo became Chairman of the Board of Engineers which built Cairncross Dock on the Brisbane River, using staff and plant from the Stanley River Works Board, the Main Roads Commission and the Department of Harbours and Marine with added labour from the Civil Constructional Corps; when completed in 1944 it was the largest dry dock in the Southern Hemisphere. Somerset Dam was completed after the war and Nimmo and his staff (then the Hydraulics Branch of the Co-ordinator General's Department) made many hydraulic investigations including the hydrology of the Channel Country in south-west Queensland, possible scour at the site of the Burdekin River road/rail bridge, a feasibility study of the Burdekin scheme and the detailed design of the Tully Falls hydro-electric project, which was built by his Branch. In 1949 he became Commissioner for Irrigation and Water Supply and directed the Department at a time of great expansion which included the construction of the Tinaroo Falls Dam and the Mareeba-Dimbulah Irrigation project. Concurrently he was chairman or a member of many interdepartmental commissions and boards. He retired in 1955 but was retained as engineering consultant to the Government and continued to serve as Chairman of the Dumaresq-Barwon Border Rivers Commission.

Nimmo was an engineer-scientist who used his sound theoretical understanding and wide knowledge in the design and construction of major works, and in directing an important department. He was unassuming in manner but definite in what he wanted, and he had both the admiration and affection of his staff. He gave much to engineering and from his student days was an active member of professional associations. He was Chairman of the Brisbane Division of the Institution of Engineers, Australia in 1937, Councillor from 1938 to 1955, President in 1949 and an Honorary Fellow from 1960. As Chairman of the National Committee he led the Australian delegation to the International Committee on Large Dams in Rome in 1961. Always ready with a useful reference, he was adept at devising investigation and construction techniques; his doctoral thesis contains some fifty-six published papers, discussions and reports written from 1916 to 1962. He was awarded the Peter Nicol Russell Memorial Medal of the Institution in 1950, the Kernot Memorial Medal of the University of Melbourne in 1956, and the CBE in 1962.

Dr. Nimmo died in Brisbane on 7 May 1970, survived by his wife, a daughter and a son.

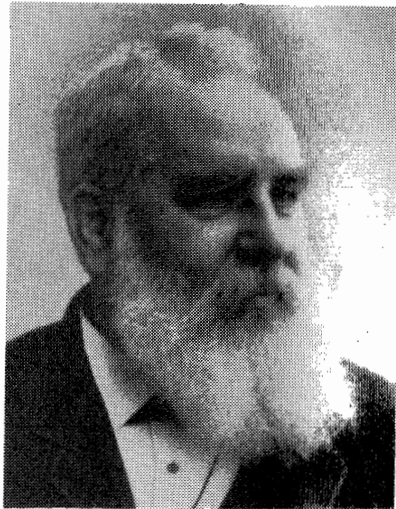
Trans. Am. Soc. Civ. Engrs, Vol. 92 (1928); Information from Mrs E. A. Wickham, Brisbane, Fryer Memorial Library, University of Qld, and personal recollections.

(ELR)

27

W. D. NISBET

MInstCE



Photograph by
courtesy of
Captain C.J.
Nisbet, RAN.

NISBET, WILLIAM DAVID (1837-1897), harbour and drainage engineer. Born at Newcastle-on-Tyne, he was articled for three years to the Engineer to the River Wear Commissioners (at Sunderland), who formed a consulting practice with him in 1868. The partners designed and supervised dock and harbour work in southern Scotland and north-east England, municipal works in Yorkshire coastal towns and a small railway in County Durham.

Nisbet arrived in Brisbane in May 1875, having been selected five months earlier from fifteen applicants as Engineer of Harbours and Rivers. There were three urgent tasks: the construction of a dry dock on the Brisbane River, the preparation of a plan for the development of the Queensland ports, and the main drainage of the municipality of Brisbane.

Early in June 1875 Nisbet reported that the proposed design for the dock was inadequate, and that the approved estimate of 25,000 pounds should be increased to 81,000 pounds. As a result he was called to the bar of the Legislative Assembly on 11 August and cross-questioned in detail about his experience, on the revised design, whether the dock was in the right place, how it should be operated and even whether or not a dock was needed. His answers to these numerous questions were prompt and well-reasoned and showed that he

was already familiar with conditions in Queensland; the revised estimate was accepted. However there may have been some over-design; before Nisbet arrived the Assistant Engineer, A.J. Goldsmith (q.v.), had prepared an estimate of 49,000 pounds and in 1926 he was still arguing that Nisbet's walls were too massive and, judging from the existing unlined work in the extended length of the dock, he may well have been correct. The dock was opened in 1881 and was in service until 1972; it is now the headquarters of the Queensland Maritime Museum.

Dredging of the outer bar of the Brisbane River began in 1862 and by 1874 small liners could reach the town wharves on the high tide. But the river-training, dredging and reclamation which have since made Brisbane a great river port followed Nisbet's report of 1877. He obtained the funds needed for a large dredging plant; two dredges came from Britain, but all the ancillary vessels and four dredges were built in Queensland. Much of the design was by the Department, including the "Octopus" which was "one of the largest iron ships built in the Colonies" when launched by R. Smellie & Co. in 1880.

Nisbet was responsible for work at all ports along the Queensland coast including Ross Creek (Townsville), Cairns, Port Douglas and Normanton. Wharfage was built at Auckland Point (Gladstone), Port Alma (for Rockhampton), in the Pioneer River (Mackay), and at Townsville and Normanton. Dredging was carried out in the Mary, Burnett and Fitzroy rivers.

The business centre of Brisbane was seriously flooded twice in February 1875. Fortunately a sympathetic Government was in power in the Colony and it took over responsibility for main drainage. Nisbet, who arrived in Brisbane during the discussions which led to "The Brisbane Drainage Act of 1875", completed the investigation of relief drain through the flooded area in August, and placed the contract in October. Nine more drains were designed, which included all the main catchments in the municipality. Six drains were built by 1879 and are still in service (with comparatively little augmentation). The remaining schemes were aborted by a change in Government and by the parochial aldermen who would not agree to the construction of proper outfalls beyond the town boundary. Until 1881 Nisbet was responsible for water-supply in the Colony (except in Brisbane), but in that year J.B. Henderson (q.v.) was appointed State Hydraulic Engineer in charge of a separate Water Supply Department.

Nisbet was active in the public life of Brisbane; in 1879 he was President of the Philosophical Society of Queensland and in 1883 the first Treasurer of its successor, the Royal Society of Queensland. Described as being "of unimpeachable integrity combined with a genial and sympathetic disposition", he retired in 1889 and returned to England where he died suddenly in London on 27 November 1897.

Parl. Deb. (Qld), Vol. 19 (1875); Min. Proc. Inst. Civ. Engrs, Vol. 131; G.R.C. McLeod, 'Dredging of the Brisbane River 1860-1910', JRHSQ, Vol. 10, No. 3 (1977-78); Information from Dr P. D. Nisbet, Sydney.

(ELR)

LIEUTENANT-COLONEL D. E. REID

DSO, VD, MAus IMM



Photograph by
courtesy of
Mrs E.
Lindley.

REID, DAVID ELDER (1864-1930), metallurgist, was born in Glasgow on 4 November 1864. He was educated at a local high school and attended Glasgow University, studying science, particularly chemistry. In Glasgow he worked for the Tharsis Sulphur and Copper Co., being their principal assayer and chemist. He was also engaged in the treatment of refractory ores with the Cassel Gold Extraction Co. (Glasgow). In 1885 Reid migrated to Queensland, being appointed Manager of a small Scottish-owned mine at Kilkivan in the Gympie district. When this mine closed he acquired an assay business in Gympie where he practised for a number of years, also undertaking experimental gold-recovery work for several mines; he is credited with the introduction of the cyanide process of gold recovery to Gympie. Reid was a director of many Gympie gold mining companies, and in the late 1890s was Manager of the then major producer, No. 2 Great Eastern Mining Co. At this mine he established a cyanide plant which treated about 1000 tonnes per month. He also personally owned a customs cyanide plant of some 500 tonnes per month capacity.

No. 2 Great Eastern had been the most easterly operating mine on the Gympie field and a shaft had been sunk to 204 m on its boundary in what was known as the Eastern Monkland ground, but without success. A Scottish-born entrepreneur living in Gympie, Matthew Laird, promoted the potential of the

Eastern Monkland leases, and when the Scottish Gympie Gold Mines Co. Ltd was floated in 1895 in Scotland with Reid as a local director, Laird was made a director and Secretary. After great personal effort and faith by Laird, the original shaft was deepened to 427 m, where rich gold was found in 1897, heralding the prosperity of Gympie's greatest mine. In 1898 Laird became General Manager and late in that year the first dividend was paid. In 1903, after distinguished service in the Anglo-Boer War Reid succeeded Laird as General Manager and retained the position until the mine closed in 1928. Under Reid's guidance the mine expanded, levels being operated down to 762 m with workings exceeding a total length of 48 km. To the end of September 1917 (by which time the mine had passed its heyday) the production of gold from a total of 1 496 026 tonnes of ore crushed was some 17.7 tonnes (568,497 fine ounces). Laird and Reid introduced modern mining practices to Gympie, including large steam winders and air compressors; rock-drills replaced hand-drills underground and in some stopes, square sets were used to support the very large openings. David Reid, as a metallurgist, was particularly proud of the 150 head of stamps in the mill and the very large cyanidation plant treating the tailings from the batteries. The Scottish Gympie mine at its peak employed 330 men underground, by far the largest number on the field.

David Reid was a member of the Australasian Institute of Mining and Metallurgy and apart from his professional attainments was a man of many parts, being particularly attracted to military service. In Scotland he had joined the Lanarkshire Rifle Volunteers and in Queensland he joined the Mounted Infantry, rising to the rank of Captain. He fought with distinction in South Africa, being awarded the DSO and Long Service Medal. He returned as Major Reid and retired from the army reserve in 1920 as Lieutenant-Colonel. He was an alderman for several years on the Gympie City Council and became Mayor in 1903. On two occasions he stood for the Queensland parliament, being narrowly defeated in each election. Reid was chairman or director of several Gympie and Brisbane companies, a clubman, a crack rifle shot, and a popular citizen.

Reid married and had one daughter; he died on 25 October 1930, and is remembered as a metallurgist who did much to further the Gympie field and its most famous mine, Scottish Gympie.

Alcazar Press, 'Queensland 1900' (Brisb, 1900), pp. 129-30, 157; Gympie Times, 28 October 1930; R. H. Donald (ed). 'A Souvenir of Gympie's Centenary' (Gympie, 1967); H. Holthouse, 'Gympie Gold' (Syd, 1973).

(IWM)

LIEUTENANT-COLONEL W.J. REINHOLD

OBE, MC & Bar, MID, BE Qld, MIEAust



Photograph by
courtesy of Mr
F. Smith.

REINHOLD, WILLIAM JAMES (1889-1966), civil and military engineer, was born and educated in Brisbane. In 1908 he passed the Senior Public Examination of the University of Sydney and taught in primary schools at Kangaroo Point and Warwick before entering the University of Queensland in 1911 with the first intake of engineering students. He graduated at the end of 1914 and was then selected with nine other Australian engineering graduates to serve with the Royal Engineers in World War I. He served as a commissioned officer in the 9th Scottish Division BEF, was three times mentioned in despatches, five times wounded and was awarded the MC and Bar. Returning to Queensland, he served simultaneously as Northern Engineer of the Public Estate Improvement Branch of the Department of Public Lands from July 1919 and the first Supervising Engineer for the Main Roads Board in north Queensland where he travelled by pack-horse locating routes for main roads through virgin tropical rain forest in mountainous country, including the Gillies Highway from Gordonvale to Yungaburra. The construction of culverts, bridges and sugar-cane tramlines, the location, design and construction of roads in the Maria Creek soldier settlement, Boonjee main road, the Bloomfield and Tully rivers areas, and the siting of the Tully central sugar mill were all carried out under Reinhold's direction.

Reinhold commenced practice as a consulting engineer in February 1923, operating from his home in Clayfield, Brisbane. The practice was closely linked with the Main Roads Board and many local authorities. The first road

constructed by a local authority under the Main Roads Act of 1920 and supervised by a consulting engineer was the Boat Mountain road in the shire of Murgon, constructed in 1923 and supervised by Reinhold; the mountain section is still in use on its original alignment. By dint of his strong personality, gift of motivating men, ability to make decisions and willingness to travel extensively in primitive conditions, he built up his practice until it embraced thirty-seven local authorities in central and southern Queensland. It was dominated by the design and construction of highways, main roads, rural roads and traffic bridges. At the same time a wide variety of industrial and community assignments was handled, including the first Olympic-standard swimming complex in Queensland outside Brisbane, completed at Dalby in 1936.

Reinhold's engineering career reached its zenith in World War II, firstly as Commander of the Milne Force Engineers at Milne Bay, New Guinea, where Japanese forces suffered their first major defeat on land in August 1942, and for which work he was awarded the military OBE in February 1944. The work at Milne Bay was surpassed by the construction of the 110 km Bulldog-Wau Road over the Owen Stanley Range, which it crossed at 3002 m at the Ecclestone Saddle, the highest altitude of any road in Australian territory. It was built between January and August 1943 under conditions of the utmost difficulty and was fully described by Reinhold in the John Thomson Lecture for 1945. General Blamey, the Australian Commander-in-Chief, said in a congratulatory personal letter to Reinhold, "Your unfailing loyalty and keen sense of duty is well deserving of the high honour conferred upon you. You have set a fine example to those serving with you and been a source of great encouragement to all". Osmar White, in the Melbourne "Herald" of April 1944, said "Miracle Road - probably the greatest feat of skill, ingenuity, and endurance ever performed by Australian Army Engineers". Invalided out of the army in November 1944, Reinhold returned home to rebuild his health and a practice that had been maintained by a skeleton staff during his absence.

In post-war years, the backlog in water-supply and sewerage schemes in smaller country towns, and the demands for improved road standards, ensured an adequate supply of work for a growing staff. The firm was also involved in the early developmental stages of the open-cut coal mine at Blair Athol, and Reinhold served on occasions as honorary consultant to the Brisbane Grammar School, the Brisbane Girls' Grammar School, the Red Cross Society, Legacy, and the Montrose Crippled Children's Home. Sir John Kemp (q.v.) said in a personal letter to Reinhold dated 14 January 1952, "...You may fairly claim to be one of the pioneers in helping to make the State more habitable and prosperous, and must derive satisfaction from it".

Always active in sport, he had been captain of cricket at school, and was for some time Captain of the Indooroopilly Golf Club. Bill Reinhold died in Greenslopes Military Hospital on 27 August 1966 after a long illness; he had been twice married and was survived by his second wife.

'Brisbane Grammar School Annals, 1869-1922' (Brisb, 1923); information from the Fryer Memorial Library, University of Qld; Mrs Jean Reinhold, Messrs V & E.C. Reinhold, Brisbane, former colleagues and personal recollections.

(RMH)

30

G. A. RICHARD

MAusIME



Photograph by
courtesy of
Mount Morgan
Limited.

RICHARD, GEORGE ANDERSON (1861-1943), metallurgist, was born in 1861 in Creswick, Victoria. He attended the Ballarat School of Mines, studying assaying, chemistry and metallurgy in 1882-83 under the legendary Professor Mica Smith.

In 1884, Richard went to Mount Morgan, central Queensland, where he was to remain throughout his professional career for the next twenty-eight years. Mount Morgan had been discovered in 1882 and two years later was still operated by a syndicate of the Hall brothers, D'Arcy and others. Wesley Hall, the youngest brother, was manager and Richard worked under him in the stamp battery and assay office. The chlorination process for the treatment of gold ores was being developed and experiments were in progress at Mount Morgan. In late 1886 Mount Morgan Gold Mining Company Ltd was formed and the "Lower Works" for gold treatment built, Richard being appointed Chlorinator-in-Charge. Development continued and the "Hall-Richard" chlorination process was introduced in the Lower Works in 1892. In 1894 he visited gold mining plants throughout Australia studying treatment methods. In the following year Richard designed the West Works for treating low-grade gold ore by chlorination and was appointed Superintendent of Treatment; in 1897 he was promoted to the position of Metallurgical Engineer. In this same year he gave

evidence on Mount Morgan treatment practice and other matters to the Queensland Royal Commission for Mines.

Shortly after his arrival at Mount Morgan, Richard had joined the Queensland Militia, and after promotion to Captain he was generally known as Captain Richard. Mount Morgan continued to expand, the Mundic works being built during 1897-1901. In the latter year Richard accompanied the company's Mine Engineer, H.P. Seale, on a visit to mines and plants in Europe, North America and South Africa, examining methods for treating copper ores because the rich surface-oxidized gold ores of Mount Morgan were being succeeded at depth by copper-gold sulphides. He also studied the iron and steel industry and subsequently gave evidence (based on his overseas tour) to the Commonwealth Commission of Inquiry into the Australian iron industry. In 1903 Richard was appointed General Manager, and in 1904-6 a copper smelter was built at Mount Morgan to treat copper-gold sulphide ores. With the depletion of local timber supplies Richard supported the search for coal, particularly at Baralaba, 110 km west of Mount Morgan where the company developed a coal mine. In 1907, the directors and staff (including Richard) promoted the Many Peaks Copper Mining Company to provide a suitable flux for the Mount Morgan ore in the copper smelter. In 1907 he again visited the USA where he inspected many copper mines, mills, smelters and refineries. As a result of his report the company promoted the Electrolytic Refining and Smelting Company Pty Ltd, at Port Kembla in New South Wales.

In 1910 G.A. Richard became President of the Australasian Institute of Mining Engineers; at its meeting in Mount Morgan he delivered an outstanding Presidential Address entitled "Statistics and Economics". Richard was an advocate of a strong and centralized Queensland School of Mines. He engaged numerous brilliant engineers to work at Mount Morgan, many coming from the Ballarat School of Mines and Sydney University. He introduced major improvements at Mount Morgan, notably "glory hole" mining, the installation of the first Australian-made electric winder, and the commencement of copper smelting. Unfortunately there were also serious disasters, including falls of ground, fire in the underground workings and problems in the copper smelters.

Richard married and had two sons and four daughters, his great interests apart from work being his family, the militia and billiards. He died on 7 September 1943, and is remembered as a notable metallurgist who did much for a great company.

V&P (LA Qld), 1897, pp. 494-502; G.A. Richard, 'Statistics and Economics', Trans. Australas. Inst. Min. Engrs, Vol. 15 (1911), p.1; The Bulletin, 6 June 1912; John Kerr, 'Mount Morgan: Gold, Copper and Oil' (Brisb, 1982); biographical research by Mrs L. MacDonald, Rockhampton; information from Mrs C. Kennedy and Mrs S. Thynne, Sydney.

(IWM)

H. E. B. SCRIVEN

BE Qld, FIEAust



Photograph by
courtesy of
Mrs N. Farmer.

SCRIVEN, HARRY EDWARD BENNETT (1893 - 1969), engineer and manager, the son of Ernest George Edward Scriven, Under Secretary for Agriculture in Queensland, and Helen Edith (nee Bennett), was one of four children born at Shottery Street, Yeronga, in Brisbane on 6 March 1893. His primary schooling was at the Normal School, Brisbane from which he entered Brisbane Grammar School, attending from 1907 to 1909 and from where he passed the then Sydney Junior Public Examination.

In 1909 Scriven was apprenticed in fitting and turning to Walkers Ltd, Maryborough, and completed his indentures in 1913. In the same year he matriculated and entered the Faculty of Engineering at the University of Queensland where he completed the degree course in Mechanical and Electrical Engineering and graduated in 1917. The degree was awarded in absentia as he had secured employment in the southern states by the time of the ceremony.

Although Scriven attempted to enlist in the AIF he was apparently rejected and found employment in munitions manufacture in Britain and in Australia. He was Assistant Engineer at the Commonwealth Arsenal in 1917 and gained experience in the installation and operation of production equipment in various munition factories in the UK. After the War he was employed for some years by William Adams and Co. Ltd in Melbourne but in 1927 he returned to Brisbane

and worked for the Engineering Supply Co. of Australia Ltd.

In 1930 Scriven rejoined Walkers Ltd in order to further their interest in diesel engines (on which he had had considerable experience in the southern states), supervising the manufacture of engines under licence from Mirlees Bickerton & Day Ltd of the UK. He also invented a machine for the mechanical charging of horizontal retorts in gasworks which was supplied in large numbers to gas-making plants throughout the eastern states of Australia. He was closely associated with the manufacture of sugar-milling machinery and was responsible for all cost estimation and drawing-office work, leading to Walkers' successful participation in this field.

During World War II Scriven was Chief Draughtsman responsible for all drawing-office work connected with the machinery side of Walkers' extensive shipbuilding programme. He held various responsible senior positions in the organization, culminating in his appointment as General Manager in June 1952 on the retirement of H.S. Goldsmith. This was a time of intense activity when the company was engaged in the production of ships, locomotives and a great amount of sugar-mill plant.

Scriven made three overseas trips on behalf of his employers. In 1954 he journeyed to the Caribbean to examine the sugar industry and to promote sales of Queensland-built machinery. In 1956 he was a delegate to the conference of the International Society of Sugar Technologists held in India, and in 1968, as the representative of Associated Engineering Manufacturers of Australia Ltd, he made a tour of South Africa and Mauritius to promote the interest of member companies with particular reference to sugar-milling machinery. The member companies were Walkers Ltd, Bundaberg Foundry and Morrison and Bearby Ltd of New South Wales. He retired in September 1961 but was retained by Walkers in a consulting capacity to ensure that his experience and expertise were still available to the company.

In 1919 Scriven was elected an Associate Member of the Institution of Civil Engineers, but he resigned in 1932 after rejoining Walkers. He became an Associate Member of the Institution of Engineers, Australia, in 1920, gaining the status of Member in 1943 (which was equivalent to the status of Fellow after 1968).

In 1921 he married Hilda Blair Whitehall in Brisbane and they had a family of two daughters and one son; Scriven died in Brisbane on 8 March 1969.

Maryborough Chronicle, 19 June 1952 and 14 June 1956;
Information from Dr W.L. Hughes and staff of Walkers Ltd,
Maryborough, Mrs B.N. Farmer, New South Wales, the
Librarian, I.E. Aust., Canberra, and the University of
Qld Archives.

(WIG)

32

H. C. STANLEY

MInstCE



Photograph by
courtesy of
Alcazar Press.

STANLEY, HENRY CHARLES (1840-1921), railway civil engineer, was born in Edinburgh on 15 August 1840, the brother of F.D.G. Stanley, the best known early Brisbane architect. After two years of preliminary study at the University of Edinburgh he was articled for five years to a firm of consulting engineers and trained on railway construction in Scotland.

On completion of his articles Stanley migrated to Brisbane and in October 1863 was appointed assistant to Abraham Fitzgibbon, who had just been engaged by the Government to build a railway from Ipswich to Toowoomba; construction started in February 1864. In January 1865, before the first section was opened to Grandchester, Stanley was appointed Engineer to the province of Marlborough, New Zealand, but when a scheme to build a railway from Picton to Blenheim lapsed he returned to Queensland in January 1866. He was re-engaged by the Government and employed first on the Rockhampton to Westwood Railway, and in June 1866 became Resident Engineer on the Southern and Western Railway, where construction was in progress on the main range towards Toowoomba. Fitzgibbon was replaced by H.T. Plews in August 1867, who in turn was replaced by Stanley as Chief Engineer in September 1872; the line had reached Dalby and Warwick by then and the immediate task was building the contentious link between Ipswich and Brisbane, previously considered unnecessary because "there was a navigable river alongside".

Construction started in January 1873 but in May 1874 Stanley was replaced,

nominally because costs were much greater than the parliament had approved. As a change of ministry had brought to power a party bitterly opposed to Stanley's choice of Roma Street as the Brisbane terminus, the "Brisbane Courier" understandably thought that he was "punished for political rather than professional reasons"; after acting as Engineer in Charge of Surveys he was reinstated as Chief Engineer, Southern and Western Railway, in September 1875.

After his reinstatement Stanley was given increasing responsibility. In 1878, when he took over the two separate railways feeding Maryborough and Bundaberg, his title was changed to Chief Engineer, Southern Division; in 1886 there was a major regrouping and he was given the Central Division and in 1892 he became Chief Engineer for Railways for Queensland. The Railways Department was by far the most important Government department, absorbing about 70 per cent of the total public capital expenditure between 1860 and 1900; the 1880s were the peak years of mainline construction and by 1890 there was a rail connection to Sydney through Wallangarra while the western, central and northern termini were at Charleville, Barcaldine and Hughenden respectively. Bundaberg was not connected to Brisbane until 1891, and there was no continuous track along the coast between Bundaberg and Cairns where the line to the Tableland had just started. Expensive bridge construction was needed to close the gaps, but the financial crisis of 1891-94 prevented major construction and brought much retrenchment of staff. In the midst of this upheaval Stanley had his most urgent professional task - the replacement of the Albert Bridge at Indooroopilly which had been destroyed by the record flood of February 1893. By June the new bridge was designed and the plans sent to Professor W.H. Warren of Sydney for checking; when the bridge was opened in December 1895 it was, in Warren's words, "the finest example of a rivetted bridge in Australia" and it is still in use. The Institution of Civil Engineers awarded Stanley a Telford Premium for his paper on this bridge.

After 1894 mainline construction was resumed, including two important steel bridges (the Burdekin at Macrossan, and the Fitzroy at Rockhampton) which were designed under Stanley's direction by two young graduates from the University of Sydney and completed in 1897. Before this, and for many years after, all the senior engineers in the Department were from Great Britain, or were trained by pupillage within the Department which gave one of the few opportunities in Queensland for professional training in civil engineering.

Stanley retired in September 1901 after being professionally responsible for about two-thirds of the 4500 km of railway track then open. He joined the Queensland Volunteer Defence Force in 1868, and commanded the Artillery as a Lieutenant-Colonel in the 1890s. He died in Brisbane on 21 February 1921, leaving four sons and five daughters, his wife having predeceased him.

Parl. Deb. (Qld), Vol. 15 (1873); Alcazar Press, 'Queensland 1900' (Brisb, 1900); Qld Govt Rlws, 'Our First Half Century' (Brisb, 1914); V. Daddow, 'Puffing Pioneers and Queensland's Railway Builders' (Brisb, 1975); Min. Proc. Inst. Civ. Engrs, Vol. 82 (1897-98); Information from John Oxley Library, Qld State Archives, Mr. J.F. Clarke and Professor C. O'Connor, Brisbane.

(ELR)

E. L. A. WEINBERG

EM Leipzig, MAUSIME, MIMM, MAIME



Photograph by
courtesy of
Sydney Mail.

WEINBERG, ERNEST LUDWIG ADOLPH (1855-1925), mining and metallurgical engineer, was born in 1855 near Hanover and received his technical training at the University of Leipzig. In 1880 he left Europe to join a large mine management firm in San Francisco which controlled several important gold and silver properties in western North America. After several years working in and managing mines in Mexico and the USA for his principals, he became Smelter Manager for the Anaconda Copper Company at Butte, Montana, for three years. He then practised as a consulting mining engineer, inspecting many mines and building small smelters.

In 1889 Weinberg came to Australia as General Manager of the Queensland Smelting Co. Ltd which was building a smelter at Aldershot near Maryborough in central Queensland for the N.M. Rothschild interests of London. Metallurgical practice in Queensland was in its infancy, consisting primarily of stamp-milling followed by the amalgamation of gold ores and the smelting of copper ores in small, simple, open-hearth furnaces. Under Weinberg's expert management, Queensland Smelting provided the first local custom facility for buying and smelting ores, obviating the need for shipment to European plants. However, without a major captive supplier of copper or lead sulphides, the company had to purchase them from a variety of eastern Australian mines for smelting with the Queensland concentrates and ores which were being treated.

In 1898 Weinberg became Manager of the Australian Smelting Co. at Dapto near Port Kembla, New South Wales. Though Weinberg returned to Queensland on many occasions, his eminence as an outstanding metallurgical engineer is based on his period with Queensland Smelting. He visited many mines throughout the Colony, introduced treatment methods and made the small works at Aldershot a notable and viable enterprise. He spoke and wrote freely on mining and metallurgical practices, particularly advocating technical education and a central School of Mines.

In May 1901 Weinberg returned to Queensland as General Manager and Chief Metallurgist of Chillagoe Railway and Mines Limited in north Queensland. Copper smelters had been erected at Chillagoe but the next year was traumatic for Weinberg and the company. As a result of his assessment the ore reserves were reduced, and the smelters were closed because of a shortage of funds. Company reconstruction permitted a resumption of operations in late 1902, Weinberg resigning from management though continuing as a consultant and associating himself with several north Queensland ventures, particularly the Mount Molloy copper mine and smelter. Weinberg continued his Melbourne-based consulting practice until he returned to the USA in 1919, where he established another consulting practice. He advised, or was on the boards of, mining companies in Queensland, New South Wales, Tasmania and New Caledonia. In Queensland his principal interests were the MacGregor, Mount Cuthbert and Mount Elliott copper mines, all in the Cloncurry district, and the Mungana lead mine, near Chillagoe.

Weinberg was a foundation member of the Australasian Institute of Mining Engineers and a member of both the American Institute of Mining and Metallurgical Engineers and the Institution of Mining and Metallurgy. He revealed the breadth of his interests in his technical papers and did much to advance metallurgical practice in Queensland.

Ernest Weinberg married and had two daughters; he died in New York in April 1925.

Wide Bay and Burnett News, 17 October 1889; V&P (LA Qld), 1897, pp. 423-7, 507; G.E. Loyau, 'The History of Maryborough, Wide Bay and Burnett Districts' (Brisb, 1897); Q.G.M.J., Vol. 3 (1901), p. 192; Trans. Inst. Min. Met., Vol. 37 (1927-8); K.H. Kennedy (ed), 'Readings in North Queensland Mining History' Vol. 1 (T'ville, 1980), and Vol. 2 (T'ville, 1982); biographical research by Mr D. Chaput, Los Angeles.

(IWM)

34

A. L. WILSON

MAusIME, MIMinE



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courtesy of
Q.G.M.J.

WILSON, ARCHIBALD LAURENCE (1850-1935), mining engineer, was born and educated in Edinburgh, Scotland. As a young man he went to the New Zealand gold diggings in 1867, leaving for the Palmer River in north Queensland in early 1878. After some luck on the Palmer he went to Ravenswood, where he remained active in gold mining for the rest of his life. Through the prosperity of New Ravenswood Ltd, of which company Wilson was the promoter, a major shareholder and the General Manager, Ravenswood became an important centre and "Wilson's town".

Alluvial gold had been found near Ravenswood in 1868, and when reefs were discovered in 1870 the first stamp-mill was erected. Rich crushings followed, but the surface-oxidized quartz was succeeded at the water-table by pyritic ore which defied contemporary methods of gold recovery. The discovery of gold at Charters Towers in 1872 depleted Ravenswood of its population although in the 1880s the silver mine at nearby Totley helped keep mining alive in the district. Wilson first operated an hotel at Totley and then obtained interests in some small local mines but most of them closed during the severe general depression of the early 1890s. Wilson and local associates then took an option on the George Battery and the nearby John Bull leases at Sandy Creek and successfully floated a company in London. By 1894 the mines had been

equipped and a new shaft was being sunk by Wilson who had become General Manager. In 1897 other major mines at Ravenswood (including the Sunset and together with the Mabel Mill) were closed and under a bank lien; Wilson again went to London and in 1898 floated them as the New Ravenswood Ltd. The success of the new company from its inception was mainly due to Wilson's drive, initiative and ability. He re-equipped the mines, sank shafts and installed winders, compressors and rock-drills. At the mill the newly-invented Wilfley tables were installed to concentrate the sulphides produced; this was Wilson's metallurgical innovation. There was only a limited amount of free gold in the ore, the rest being associated with lead sulphide (galena) and iron, copper, and arsenical pyrites. In the Mabel Mill the ore was crushed in stamp batteries feeding direct to Wilfley tables, which produced concentrates of free gold, galena and other sulphides. The gold and galena were ground with mercury and produced most of the gold; the balance, which was in the pyritic concentrate, was sent to Queensland Smelting near Maryborough for recovery by smelting. Crushing commenced in January 1900, the company paying 50 per cent dividends on a capital of 50,000 pounds in each of the first two years, vindicating both the investors and Wilson. In the decade to 1912, it produced some 7 tonnes (200,000 fine ounces) of gold, paying almost 300 per cent in dividends. The tide turned in 1912, when lower grades of ore and a prolonged strike affected the mines, the company and the town. Wilson expended every effort to reduce costs but he is reported to have had an abrasive and demanding personality; the miners turned against him and the mines closed in 1917. He had come up the hard way, his energy and technical achievements are to be admired and although he was not always liked, he brought prosperity to the Ravenswood field.

Wilson was a Member of the Australasian Institute of Mining Engineers and the Institution of Mining Engineers, and a Fellow of the Society of Accountants. He married and had two sons and two daughters; he died in October 1935.

'The Ravenswood Goldfield', Q.G.M.J., Vol. 2 (1901), pp. 404-6; 'A.L. Wilson', April frontispiece, Q.G.M.J., Vol. 3 (1902); Townsville Daily Bulletin, 20 & 21 March 1975; K.H. Kennedy (ed). 'Lectures in North Queensland History', 2nd Series (T'ville, 1975); K.H. Kennedy (ed). 'Readings in North Queensland Mining History', (T'ville, 1980), Vol. 1; information from Mr P. Kean, Ravenswood, and Mr D.C. Roderick, Brisbane.

(IWM)

ABBREVIATIONS

ADB	Australian Dictionary of Biography
Aus. I. M. M.	Australasian Institute of Mining and Metallurgy
Bull. Australas. Inst. Min. Metall.	Bulletin of the Australasian Institute of Mining and Metallurgy
Jour. Inst. Civ. Engrs	Journal of the Institution of Civil Engineers
Jour. I. E. Aust.	Journal of the Institution of Engineers, Australia
Jour. Inst. Elec. Engrs	Journal of the Institution of Electrical Engineers
JRHSQ	Journal of the Royal Historical Society of Queensland
Min. Proc. Inst. Civ. Engrs	Minutes of the Proceedings of the Institution of Civil Engineers
Parl. Deb. (Qld)	Reports of Parliamentary Debates in Queensland
Proc. Australas. Inst. Min. Metall.	Proceedings of the Australasian Institute of Mining and Metallurgy
Qld Div. Tech. Papers, I.E. Aust.	Technical Papers of the Queensland Division of the Institution of Engineers, Australia
Q.G.M.J.	Queensland Government Mining Journal
S.E.Q.E.B.	South East Queensland Electricity Board
Trans. Am. Soc. Civ. Engrs	Transactions of the American Society of Civil Engineers
Trans. Australas. Inst. Min. Engrs	Transactions of the Australasian Institute of Mining Engineers

Trans. I. E. Aust.	Transactions of the Institution of Engineers, Australia
Trans. Inst. Min. Met.	Transactions of the Institution of Mining and Metallurgy
V&P (LA Qld)	Votes and Proceedings of the Legislative Assembly of Queensland.



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